

# AUTOMOTIVE INDUSTRIES

**AUTOMOBILE**

Volume 68

Reg. U. S. Pat. Off.

Number 19

JULIAN CHASE, Directing Editor

DON BLANCHARD, Editor

P. M. HELDT, Engineering Editor      JEROME H. FARRIS, Ass't Editor  
JOSEPH GESCHELIN, Eng. Editor      ATHEL F. DENHAM, Field Editor  
GEOFFREY GRIER, Art Editor

## Contents

Do They Knock or Boost YOUR Car?	
By Athel F. Denham .....	573
New Terraplane Six .....	576
Just Among Ourselves .....	577
Alloy Iron Ring Carriers Reduce Cylinder Wear and Give Aluminum Pistons Longer Life. By Dipl.-Ing. E. Mahle...	578
Production Lines .....	583
Is Decentralization Industry's Next Step?	
By Joseph Geschelin .....	584
Should We Try a Partnership of Business and Government? By Don Blanchard.	586
Tests Show How Much Streamlining Car's Under-Portions Would Cut Drag. By Neil P. Bailey .....	589
The Forum .....	590
New Developments .....	592
News of the Industry .....	594
Calendar of Coming Events .....	602
Advertisers' Index .....	36

Automotive Industries is published every Saturday by

### CHILTON COMPANY

Chestnut and 56th Streets, Philadelphia, Pa.

C. A. MUSSELMAN, President and General Manager  
J. S. HILDRETH, Vice-Pres. and Director of Sales  
W. I. RALPH, Vice-Pres.      G. C. BUZBY, Vice-Pres.  
A. H. VAUX, Secretary and Treasurer  
JOHN A. CLEMENTS, Asst. Treasurer  
GEO. D. ROBERTS, Advertising Manager

Cable Address.....Autoland, Philadelphia  
Telephone .....

### OFFICES

New York—U. P. C. Bldg., 239 W. 39th St., Phone Pennsylvania 6-0080  
Chicago—367 West Adams St., Phone Randolph 9448  
Detroit—710 Stephenson Bldg., Phone Madison 2000  
Cleveland—1140 Guardian Bldg., Phone Main 6860  
San Francisco—1045 Sansome St., Phone Douglas 4306  
Los Angeles—Room 651, 1208 Maple St., Phone Westmore 6477  
Portland, Oregon—72 Fifth St.

Controlled by United Publishers Corporation, 239 W. 39th St., New York; ANDREW C. PEARSON, Chairman, Board of Directors; FRITZ J. FRANK, President; C. A. MUSSELMAN, Vice-President; F. C. STEVENS, Treasurer.

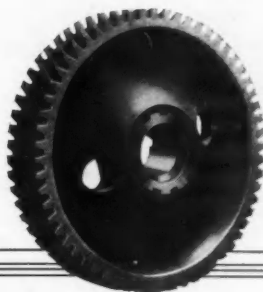
SUBSCRIPTION RATES: United States, United States Possessions, and all countries in the Postal Union, \$1.00 per year; Canada and Foreign, \$4.00 per year. Single Copies, 25c.

COPYRIGHT, 1933, CHILTON COMPANY

Member of the Audit Bureau of Circulations  
Member Associated Business Papers, Inc.

Automotive Industries—The Automobile is a consolidation of the Automobile (Monthly) and the Motor Review (weekly), May, 1902; Dealer and Repairman (monthly), October, 1903; the Automobile Magazine (monthly), July, 1907, and the Horseless Age (weekly), founded in 1895, May, 1918.

Automotive Industries



## TEXTOLITE TIMING GEARS

### Durable Timing Drives

A well-designed timing-gear drive will last the useful life of a car, unless neglect of proper lubrication causes a seized camshaft. In that case, the timing gear provides the cheapest and most effective "break-pin" possible.

Not only does the Textolite gear stay on the job, but it stays quiet. Its wear does not change the timing relation of the camshaft. The original timing is exactly maintained.

It is more than a coincidence that the used cars in which nonmetallic timing gears were original equipment command the better market.



830-134

# GENERAL ELECTRIC

May 13, 1933

# THE BENDIX DRIVE

*"The Mechanical Hand That Cranks Your Car"*



# Cars that are easier to drive are easier to sell!

**E**VERY motor car merchant meets competition on practically every sale today... competition that fights it out step by step, point by point, feature by feature.

That's the kind of selling in which Startix pays its inexpensive way a dozen times over.



**STARTIX**  
*The Automatic Starting Switch*

Ask any salesman who has Startix to talk about. He'll tell you, and show you, it has more appeal than some features which cost the manufacturer many times as much.

Just a turn of the switch-key, and Startix takes charge of the engine... starts it, repeats if the engine fails to continue running, re-starts the engine if it stalls.

What an ideal team-mate for time-proved Bendix Drive, "the mechanical hand that cranks your car"! Standard on more than twenty million cars and trucks.

Startix and the Bendix Drive give automatic starting... cars with automatic starting are easier to drive and easier to sell.

**ECLIPSE MACHINE COMPANY, Elmira, N. Y.**  
*(Subsidiary of Bendix Aviation Corporation)*

60,000 Independent  
REPAIRSHOPS — —

## Do They Knock or Boost YOUR Car

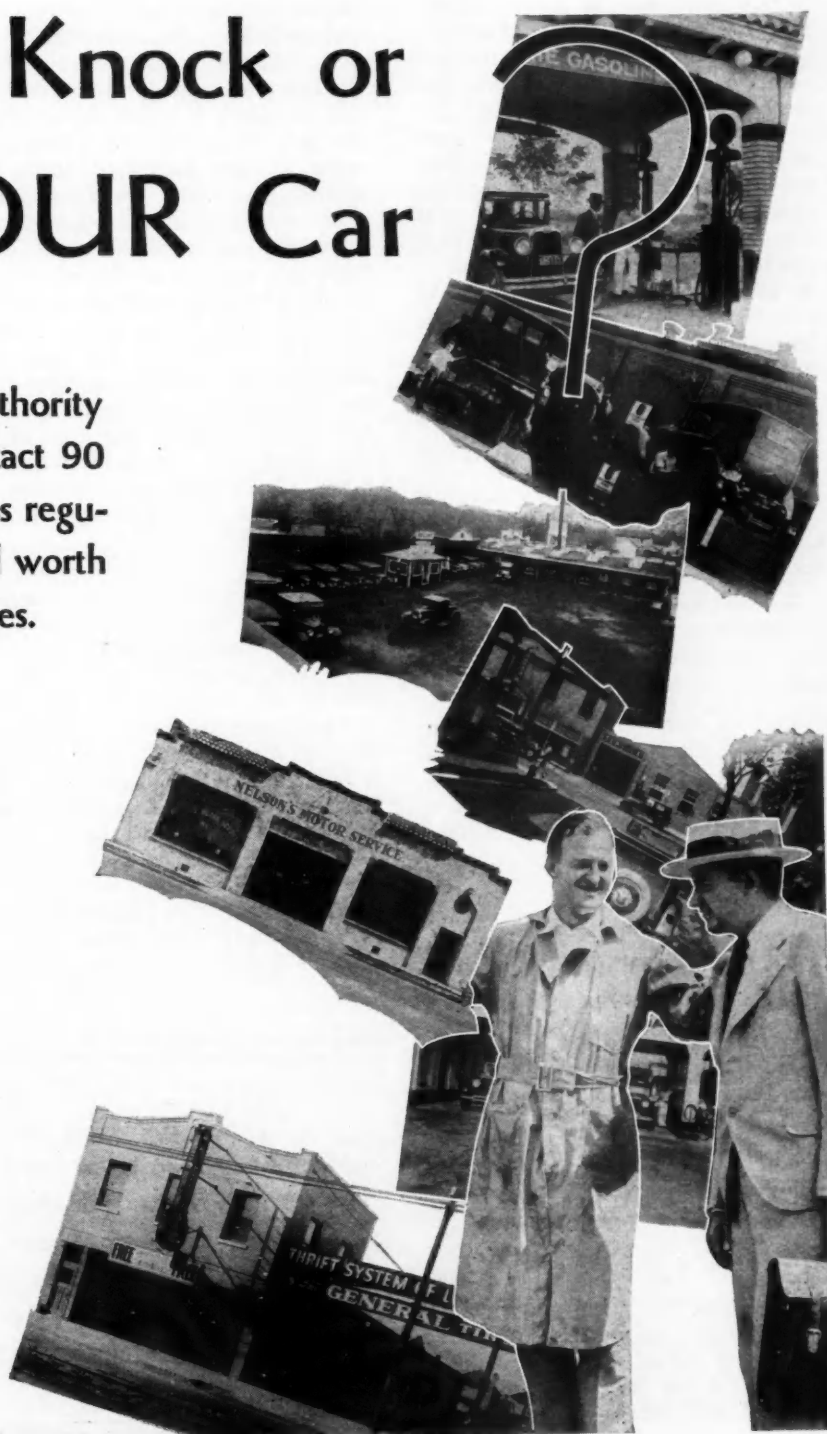
They represent unbiased authority to car owners and they contact 90 per cent of them more or less regularly—Their good-will is well worth cultivating by car factories.

by Athel F. Denham

Field Editor, Automotive Industries

**H**AVE car manufacturers missed a bet in the development of new car sales?

Recognizing that at least 75 per cent of all passenger car sales do not originate in contacts established directly between the dealers' organizations and prospects, car manufacturers at various times have attempted to enlist, even if sometimes half-heartedly, the aid of almost every kind of assistance in creating leads for the sale of new cars. They have used the radio, owners' booster clubs, consumer magazine advertising, the children of owners, furniture and department stores, daily and weekly newspapers, direct mail to owners, and even ministers, dry cleaners and





barbers. And yet, lying virtually undeveloped right on the doorstep of the car retailing field, is the biggest organizable potential and the most potent single influence contributing to new car sales and selection—the independent and neighborhood service stations.

It is possible that animosity toward this group, on the part of the car producers' own retail organizations, growing out of service sales competition has prevented producer and dealer alike from recognizing the full extent of the independents' potential and even realizing his actual contributions to new and used car sales. Whatever the reason may be, this field, of which the importance is obvious after a brief consideration, has remained virtually untouched.

The 75 per cent or more of new and used car buyers, who approach the dealer instead of being approached by him when the first contact is made, have at that time, already made up their minds as to the kind of car to be purchased. At least the range of selection has been limited to not more than two or three makes at the outside.

What has influenced these prospects in making their selections? The three major factors in each case are:

1. The suggestion or advice of a friend who owns a car of the make under consideration.
2. Advertising and direct mail to owners.
3. The advice of an impartial authority.

Let us take an average case, Mr. John Smith is about to buy a car. More likely than not, he is moved to do so because his present car is beginning to give him trouble or at least will require the expenditure of quite a little money for service, tires and other things in the coming months.

Advertising and direct mail give him perhaps a clue as to several cars in which he might be interested. His neighbor may have a car of one of these makes. If it is a recent model, Mr. Smith will want to know particularly how much trouble the neighbor has had with it, how it performs, how comfortable and economical it is. But his neighbor may be biased and probably is. He would naturally defend his own judgment. His neighbor may not have such a car.

Mr. Smith has been taking his own car to Jones' Garage a couple of blocks down the street for adjustment and minor repairs. He

talks over his problem with David Jones, the proprietor. "What do you think of the Simple Six, this year, Dave? Do you think it's a good buy? How about that new Able Eight—are they giving much trouble? Do you think that that new transmission in the Princely job is all it's cracked up to be? What is this deflection converter the Underslung people are advertising; what does it do and does it work?"

To John Smith, Dave Jones is the "impartial authority" on whom he feels he can rely. Jones doesn't sell cars himself and he services all makes. He is unbiased and Smith thinks he knows everything about automobiles. But does he? We are inclined to doubt it. Even though the trade press editorially has certainly told him a lot about the new cars; even though in some cases, a few factories have furnished him with technical information to help him in his service business; nevertheless, aside from this, his opinion is based largely on the service experience of earlier cars of the make his customer Smith is thinking of buying. The manufacturer hasn't done his part in trying to sell him on the new models, hasn't told him, in his own language, what he needs to know about new developments in order to form a favorable opinion of their value.

Factories have made some attempts to capitalize the natural good-will of their car owners. They have done next to nothing, however, to assure themselves of a favorable verdict at the hands of the independent service man. And if the service man doesn't have all the latest information he isn't an authority. The mere fact that he tells John Smith, "I don't know much about it—it may be o. k. but you can't prove it by me" is enough to make friend Smith rather cautious. Dave's honest indifference becomes Smith's doubt.

Is this a special case, or is it general in character? Investigations to date all point to the correctness of the latter assumption. Some time ago, for instance, the Chilton Company, publishers of *Automotive Industries*, sent a questionnaire to independent repair shops on which was found the following question:

"Do your customers, when considering the purchase of a new car ask your advice as to what make of car to buy, or your opinion regarding the makes of cars they have in mind?"

While ninety-five per cent of those returning the questionnaire answered "yes" to this question, the amplification of the answers submitted showed clearly the great extent to which the motoring public relies on the independent repair shops for expert advice in new car purchasing. This questionnaire was sent out last year, but in view of the fact that the expenditure involved in the purchase of a new car has, if anything, increased in importance to the average family or individual since that time, it can safely be assumed that the seeking of such expert advice is growing rather than diminishing.

What proportion of the potential market comes under the influence of the independent service station? Here are some figures:

1. There are 60,000 independent repair shops as against 38,000 dealer service departments.
2. The car dealer's service business is divided approximately between 75 per cent on cars less than three years old and 25 per cent on cars three years old and more. (See *Automotive Industries*, April 15th, 1933.)
3. The proportion of cars less than three years old to those more than three years old is approximately 28 to 72 per cent at present. (See *Automotive Industries*, April 15, 1933.)

---

It can be safely said, that the independent service man is, at very least, a potential influence in new car selection in the case of roughly 80 per cent of all car owners. This 80 per cent may easily represent 90 per cent of new car prospects owing to the high average age of the cars which these prospects own.

---



4. Assuming that the car dealer gets more than his normal share of service business on all cars less than three years old, and assuming further that he services  $2\frac{1}{4}$  times as many of these cars as the independent, we find that all car dealers together are obtaining service business on a total of roughly 5,000,000 automobiles, divided as follows:

Cars less than three years old ..... 3,690,000  
Cars three years old or more ..... 1,230,000

5. This means that the independent garage has routine service contacts with at least the following number of owners:

Cars less than three years old ..... 2,460,000  
Cars three years old or more ..... 14,120,000

6. In other words the independent garage is in contact with more than 90 per cent of owners of cars three years old or more—the biggest potential market for new car sales.

It might be said that many of the cars three years old or older are serviced by neither the independent nor the dealer, but by the owner, but offsetting this is the fact that many owners go for service to both independent and car dealer, with the result that the "independent authority" influence also extends to many of the owners probably listed as "serviced by dealers." It can be safely said, therefore, that the independent service man is, at very least, a potential influence in new car selection in the case of roughly 80 per cent of all car owners. This 80 per cent may easily represent more than 90 per cent of new car prospects, owing to the high average age of the cars which these prospects own.

These figures, of course, are for the industry as a whole. Now let us see how an average dealer organization fits into the picture. Suppose a factory has 2,000 dealers and they service an optimistic average of 280 owners each. Registrations average 225 per service outlet for the country. That means that this particular group of dealers is service contacting a total of only 560,000 automobile owners or merely 2.6 per cent of the entire car owner population. In other words, 97.4 per cent of all car owners (and present car owners make up by far, the greater part of our prospective market today) are subject to the influence of competitive dealers and independent garages or service stations.

---

**The independent can be made a major factor in contributing to the sales effort of any car manufacturer willing and capable of cultivating him.**

---

A further consideration of this point shows, in the case of the average dealer in this group, that:

1. The number of dealers attempting to influence car owners or prospects to buy their cars instead of his, outnumber him by from 18 to 45 to one, according to type of community.
2. The number of independent service stations which can exert an influence in his favor or against him, outnumber him by from 23 to 82 to one, according to type of community.

Let us look at these figures still another way. According to type of community, there are registered, per dealer, from 7,880 to 27,135 cars. Each one of these owners might be a prospect for the dealer under consideration, especially if he has a multiple franchise. No dealer, however could support an organization capable of contacting anything like this number of owners.

Moreover there are changes in buying habits to consider. In analyzing the effects of these changes we must take the following facts into account:

1. Only one out of 20 owners is buying a new car this year as against one out of five a few years ago. Therefore:
2. It would require a sales force four times as great to attain the same effectiveness in uncovering prospects. No sales organization of such size could support itself. Moreover:
3. 80 per cent of all prospects purchase within 30 days of the time they become active. The chance of establishing a contact to exert influence over any given buyer at the critical time obviously has been radically reduced. This faster buying is due mainly to the fact that:
4. Owners are becoming active prospects today more because of a definite need for cars and because

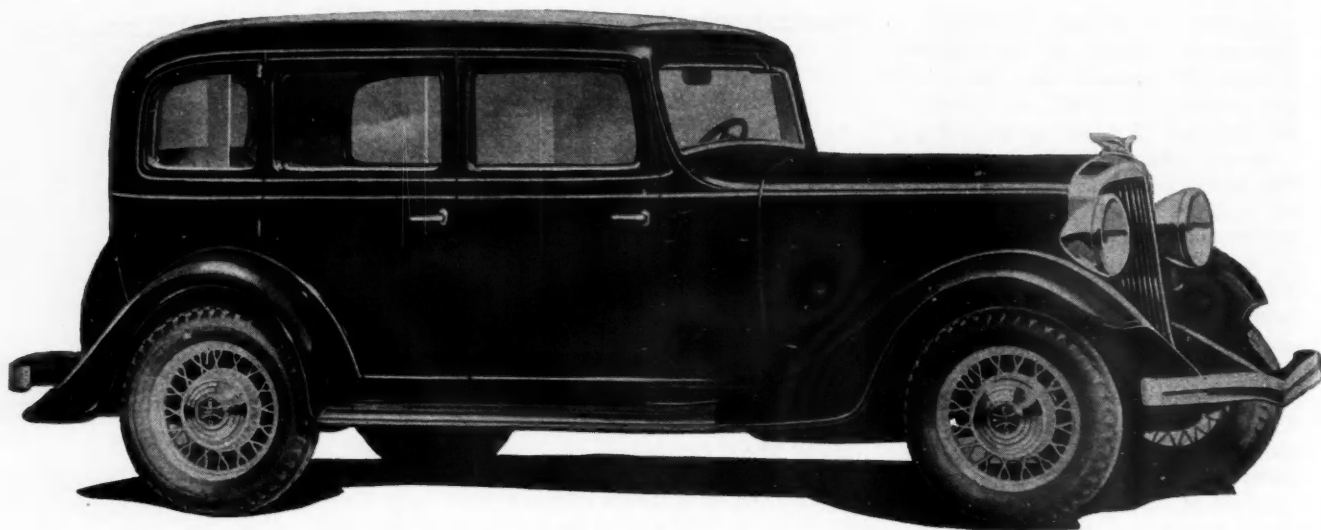
they are faced with necessary expense for repairs, etc., on their present cars, and less because they are "trying to keep up with the Joneses."

These points are brought out mainly to indicate the unavoidable loss in influence which the dealer exerts today directly on new car sales, and the necessity of taking advantage of every possible outside influence.

We revert now to our three major influences in new car sales. Advertising direct to consumers remains the principal standby of the automobile manufacturer. The influence of present owners can be cultivated, but here also a change must be noted. The kind of service the car has been giving, which, in turn, depends to a great extent on the service rendered, is more important today than ever before. Manufacturers who have adopted the policy of furnishing service stations with technical information have a definite potential advantage in this direction.

The last item—the influence of the independent authority—and the service man functions as such in his community—still remains to be organized. Establishment of "authorized service stations" has proved helpful in this direction, but such establishments represent only a minor proportion of the independent service field, and they might also be said to decrease in importance as "unbiased authorities" in direct proportion as they become associated with a particular retail organization.

The simon pure independent has his personal prejudices perhaps, but since they do not involve his business directly and since he services all makes of cars, these prejudices are rarely deep-seated. He can be made a major factor in contributing to the sales effort of any car manufacturer willing to and capable of cultivating him.



The Essex Terraplane Special Six Sedan fills the gap between the Standard Six and the Terraplane Eight

## New Terraplane Six

**N**EW Essex Terraplane Six Special Models are announced by the Hudson Motor Car Company, with wheelbase increased from 106 to 113 in., and prices reduced from \$15 to \$25 for the various models. A comparison of prices follows:

	New Price	Former Price
2-4-p. Roadster ..	\$505	\$525
Business Coupe ..	505	none
2-4-p. Coupe ....	555	570
5-p. Coach .....	525	545
4-door Sedan ....	575	595
5-p. Phaeton ....	535	none
2-4-p. Convertible Coupe .....	575	595

The Essex Terraplane Six Standard models on a 106 in. wheelbase chassis and with prices ranging from \$425 to \$555, will continue without change, as is the Terraplane eight on a 113-in. wheelbase, and prices from \$615 to \$675. The new Special Six comes midway between these two cars with the

### Special Models Featured by Longer Wheelbase and Lower List Prices

longest wheelbase in the \$500 field.

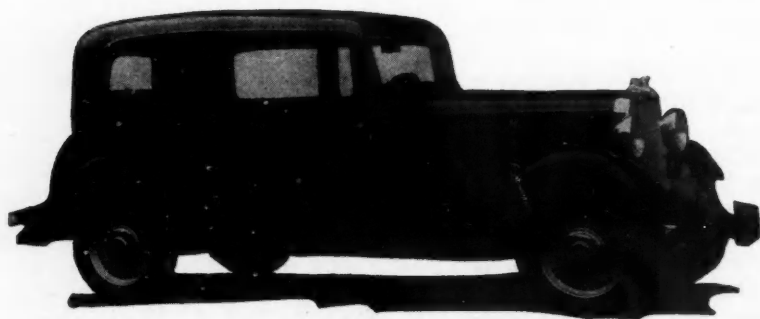
It is claimed by Hudson officials that the new Special Six weighs only about 80 to 100 lb. more than the Standard Six. Two optional gear ratios are available 4-1/9 to one and 4-5/9 to one, the latter for exceptional hill climbing and acceleration. Standard equipment includes 5.25-in. tires on 17-in. wheels, with 6.00/16-in. air wheels available at slightly extra cost. The increase in wheelbase naturally is reflected in considerably enlarged interior body length.

In design the new Special Six follows closely Terraplane eight prac-

tice. The bottom closure of the body forms a web over the top of the frame, being attached to the X-member at several points as well as the side rail flanges, a practice which is claimed by Stuart G. Baits, chief engineer of Hudson, to save some 400 to 500 lb. in weight for no lessening in structural strength.

As on other Terraplane models, a certain amount of flexibility is designed into the engine mountings to prevent the transmission of engine vibrations to the frame, and thus to the body and passengers. The six-cylinder engine carries a head with large waterjackets, 14 mm. spark plugs and an exceptionally high compression ratio for standard fuels of 5.8 to one.

Clutch is of the characteristic Hudson-Essex cork insert type. Double acting thermostatic shock absorbers are included in the equipment it is understood. Fenders have the modern valances to conceal the chassis and prevent splashing of mud on the bodies. On the dash are flashing signal lights instead of gages to show whether or not the oil pressure and ammeter charging rate are correct.



The Special Six Coach is listed at \$525

# JUST AMONG OURSELVES

## Guaranteed Prices Sought

VEHICLE manufacturers have become fearful of sudden increases in prices of parts, equipment and raw materials. Parts manufacturers have had many requests in the last few weeks for guarantees of future deliveries at current prices.

First intimation of this movement came over a month ago when we learned that the imminent passage of the Black 30-hour-week bill had begun to worry some vehicle makers from the standpoint of parts prices as well as from the standpoint of its direct application to their own plants. That started us to nosing around more carefully.

But before we had snooped far, the news became public that inflation apparently was to be a definite part of the Roosevelt legislative program. Then we began to find plenty of examples of requests for future price guarantees nearly everywhere we turned. From parts makers in every part of the country came the information that price chiseling was at a new low for the moment; that vehicle customers were actually concerned about maintenance of present price levels.

Such good news had not reached us in many, many months. We see in these requests the first indication of price stiffening in the automotive industry which, it is to be hoped, will lead to the logical conclusions of higher retail prices for motor vehicles, higher prices for parts, higher wages for employees and greater profits for all concerned.

## Parts Makers Cautious

IT'S interesting to note, moreover, that all parts makers are not jumping at the chance to assure stable prices for a few months ahead—in some cases the requests are for guaranteed prices to the end of 1933. In certain instances, of course, the vision of freedom from further chiseling for a period has been too alluring to put aside. Some guarantees undoubtedly have been made, for the struggle for business is just as intense as ever.

Other parts manufacturers, however, have refused to commit themselves about future prices, partly as a matter of self-protection. They see equal chances of increases in their raw material prices and are fearful of tying themselves up to agreements which later they might be able to fulfill only at a loss. In parts as in vehicle plants inventories on the average are very low. Consequently, prices based on exhaustion of current material inventories would mean very limited projection into the future.

\* \* \*

## Hope for Car Builders

THE present period is critical for many companies. Refusal to make desired price guarantees may open a particular company to new competition. Acquiescence may result in later squeezing from inflationary effects on raw material prices.

Much depends on the attitude of the parts industry in general

at this time. Refusal by parts manufacturers to make economically unsound commitments will give car makers good reasons for price increases; reasons which can be told frankly to the public; reasons which may even help rather than hurt the volume of car sales.

Car manufacturers today are hoping that they will be able to increase their prices. Each lead the procession; some of the largest at the moment profess to "see no immediate basis for price rises." If all vehicle manufacturers, however, are confronted by a stiffening in the structure of parts prices, the practical chances for higher retail prices will be greatly enhanced.

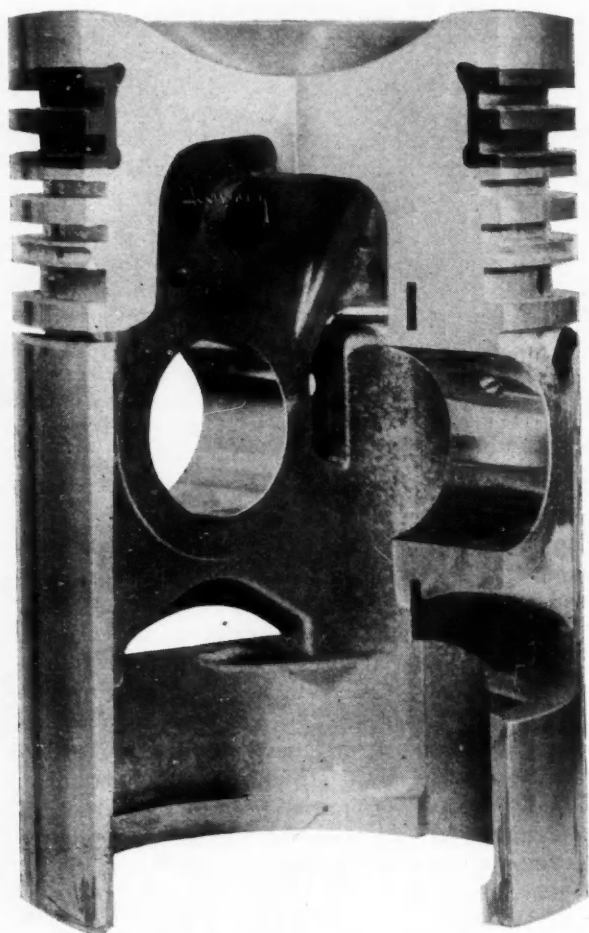
\* \* \*

## Production for Fair

THE more we hear about details of automotive exhibits and events scheduled for the Century of Progress exhibition, which opens in Chicago on June 1, the more interesting they seem. It's been known for a long while, of course, that Chrysler, General Motors and Firestone were going to have individual buildings and that scores of other automotive concerns were going to exhibit.

Chrysler is going to operate a proving ground, we hear, and at the rear of the General Motors building will be a full-fledged Chevrolet assembly line in operation with an assembly plant manager and everything. E. L. Wright, who has been in charge of the Chevrolet plant at Janesville, Wis., for the last eight years will be in charge of the operation at the World's Fair where 25 to 30 Chevrolet coaches and sedans will be produced each day.—N. G. S.





Invar-strut piston with ring carrier

THE two most pressing problems that presented themselves when light-alloy pistons were first introduced for use in internal combustion engines were that of the best method of transmitting the pressure from the crown to the bosses in this particular piston type, and that of assuring proper guiding of the piston skirt in the cylinder bore. After these had been satisfactorily solved, it was found that the light-alloy piston still compared unfavorably with gray iron pistons in one respect—its ring-belt section had a shorter life. This was proven again and again, and especially in such heavy-duty applications as in automotive Diesels, aircraft engines, high-speed two-stroke engines, and air-cooled engines of all types. It was only natural that in the further development of light-alloy pistons, efforts should be directed mainly toward overcoming this last advantage of the gray iron piston, by seeking to increase

the life of the light-alloy piston so it would at least equal that of the iron piston, and exceed it if possible.

If we examine light-alloy pistons that have seen considerable service, we find that the wear in the bore of the piston bosses and on the skirt is very slight, and generally hardly measurable. The piston, therefore, was not removed from the engine by reason of wear on the skirt, as is so often supposed to be the case, even by technicians. The real reasons for removing the pistons are the following:

- (a) Reduction in engine output,
- (b) Blow-by of gases of combustion into the crankcase and consequent entrance of noxious gases into the car body.
- (c) Increase in the oil consumption beyond the economical limit.
- (d) Increase in the fuel consumption of the engine beyond the economical limit.
- (e) Slapping of the piston in the

# Alloy Iron Ring Wear and Give A

by Dipl.-Ing. E. Mahle

cylinder, that is, too much engine noise.

All of these difficulties can be traced back, not to wear of the piston skirt, but to wear of the piston rings in the radial and axial directions, and to wear of the cylinder bore, which is related thereto. (Figs. 1 to 3.)

The close relation between the wear of piston rings and the wear

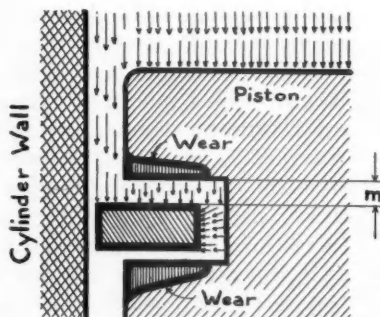


Fig. 1—Wear of piston land due to the dynamic load of gaseous pressure. This wear occurs the earlier the greater the original lateral clearance

of cylinder bores has been proven repeatedly. The quicker the piston seal deteriorates as a result of wear of the ring grooves and rings, the more the conditions of lubrication are impaired and the more rapid is the wear of the cylinder bore.

Let us consider the operating conditions of the ring section. First

# Carriers Reduce Cylinder Aluminum Pistons Longer Life

Nickel iron carrier has same thermal expansion as aluminum and maintains hardness at elevated temperatures

we must determine the temperature of the first piston ring and of the walls of the ring groove. Fig. 7 shows the temperatures in the ring section. Normally the temperature at the first ring groove is about 400 deg. F. in the case of light-alloy, and 575 deg. in the case of iron pistons. In cases of extra severe service, of which a number of examples were mentioned in the foregoing, these temperatures are 20 to 50 per cent higher. When it is considered that the flash point of lubricating oils is just about 400 deg. F. and slightly over, the exceptional importance of a low temperature at the first ring groove becomes immediately apparent, for 200 deg. F. more or less makes the difference between good and poor lubrication. In the one case, with 400 deg. F., we have tolerable lubrication, while in the other, with 600 deg., the oil burns immediately, deposits of oil coke accumulate, and the piston ring sticks in the first groove.

As a matter of fact, these accumulations of oil coke are much more pronounced in cast iron than in light-alloy pistons, and only the high resistance of cast iron to abrasion makes it possible for the ring section to withstand the

stresses of difficult service—in most cases, though by no means always. The temperature of the piston rings, and especially of the first ring, is slightly higher than that of the first groove, for the first piston ring is also contacted directly by the gases of combustion. It is true that the heat absorbed by the crown of the piston is transmitted to the cylinder wall through the piston rings, but the second and third ring are more effective in this respect than the first.

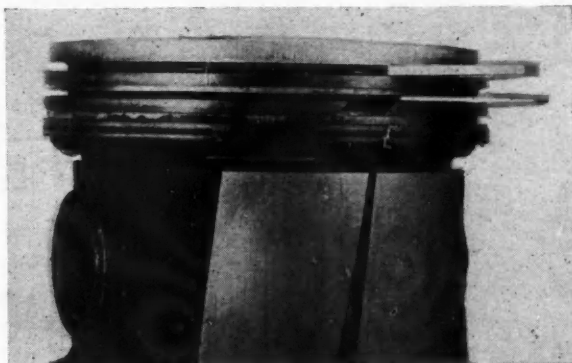
The temperature of the first piston ring can also be arrived at by measuring the tension of the ring before installation and upon removal from the engine after prolonged test runs. It will be found that the loss in tension is greater for the first ring than for the remainder, and by then reducing the tension of

the other rings to the same degree as that of the first, by heating them in a salt bath, the temperature which the first ring attained in service can be arrived at indirectly. This brings us to a problem of primary importance in engine development, namely, the production of heat-resistant piston rings. There is still much to be done in this field.

If, then, the light-alloy piston is superior to the gray-iron piston with respect to the temperature of the first ring groove, what is the reason the ring grooves and rings in it wear more rapidly? In this connection we must consider the wear resistances of the various piston materials. This subject was thoroughly covered in the excellent treatise of Dr.-Ing. Koch, Stuttgart, "Characteristics of Piston Materials with Special Reference to Wear Resistance," 1931. It is there shown, with the aid of numerous curves and tables, that the Brinell hardness of all light alloys has already dropped materially at 400 deg. F., as compared with the hardness at standard temperature. (Fig. 5.)

The best values for special light-alloys for pistons at 400 deg. F. are not nearly as good as those for ordinary cast iron at the same temperature. It is one of the important characteristics of cast iron that its mechanical properties are not noticeably reduced on heating

Fig. 2—Ring belt of a light-alloy piston with worn ring grooves after about 30,000 miles of service. First groove feeler 0.080 in. Second groove feeler 0.060 in.



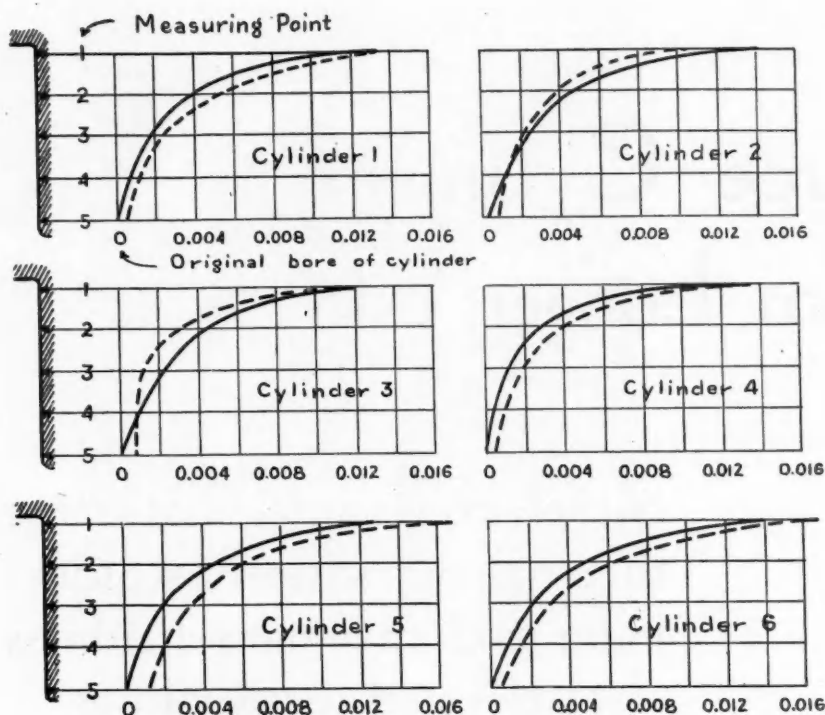


Fig. 3—Cylinder measurement record after 68,500 miles of service

(Berlin Transit Company, vehicle No. 900, Oct., 1929-Aug., 1931, Maybach six-cylinder engine No. OS5, Nelson-Bohnalite pistons.)

to 575 deg. or 750 deg. F. If, instead of taking the Brinell hardness as a measure of the resistance to wear, we take the results of actual wear measurements (as given in the report of Dr. Koch already mentioned), we find that even at the standard temperature of 68 deg. F. the following relations exist:

Wear of Bohnalite on gray iron .....	1.0
Other aluminum-copper piston alloys on gray iron according to composition.	0.8-1.2
Aluminum - silicon piston alloys on gray iron .....	0.6-0.8
Gray iron on gray iron, according to composition.	0.2-0.45

The well-known piston alloy Bohnalite is here taken as a standard of comparison, and its wear factor on ordinary gray iron (cylinder material) is given. At higher temperatures, such as 400 deg. F., that of the first ring groove, the difference between the wear factors of gray iron and light-alloys is materially greater.

We have thus shown that neither the gray-iron piston with its relatively high temperature at the first ring groove, nor the light-alloy piston with its low wear resistance at the first ring groove (not on the skirt) is ideal, in spite of the more favor-

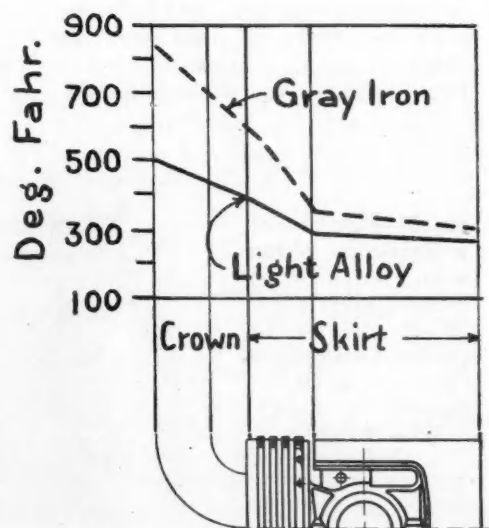
able conditions of lubrication in the latter and its lower temperature. After efforts to obtain from leading metallurgists at home and abroad, alloys that would show great hardness at high temperatures (at least 100 Brinell at 575 deg. F.) had failed; and after experiments with Eloxal, beryllium bronze and other alloys had not given the desired results, I was compelled to resort to expedients of design, and I have succeeded in combining the advantages of both materials for the

first ring groove, by armoring a light-alloy piston at the ring belt with a ring carrier of alloy cast iron. Fig. 7 shows a number of different designs which have been evolved so far.

It was soon found that any attempt to combine ordinary gray iron, with a coefficient of heat expansion of 0.000067, with light-alloys having a coefficient of heat expansion of 0.000134 was doomed to failure; such combinations regularly resulted in loosening of the carrier, due to the high temperatures occurring in the ring section, and the difference in the heat expansions. To remedy this, use was made first of an aluminum-silicon alloy with a heat-expansion coefficient of 0.000010, which was armored with a ring carrier of an alloy iron with large nickel and copper contents (15 per cent nickel, 5 per cent copper), of about the same coefficient of heat expansion as the aluminum alloy. Such an alloy had been placed on the market some time previously by the International Nickel Company under the name of Ni-Resist or Nimol, but not for this particular purpose. Later it was found possible also to armor aluminum-copper piston alloys (which possess the advantages of somewhat greater thermal conductivity and better machinability) with an iron of even higher nickel and molybdenum content, or manganese content, so that in this case also the heat expansion coefficients could be adjusted to each other.

This construction offers the advantage that the low temperature of the ring section of the light-alloy piston is combined with the excellent wearing qualities of gray iron. It results in a greatly increased life of cylinder bores, rings

Fig. 4—Temperature gradients in gray-iron and light alloy pistons





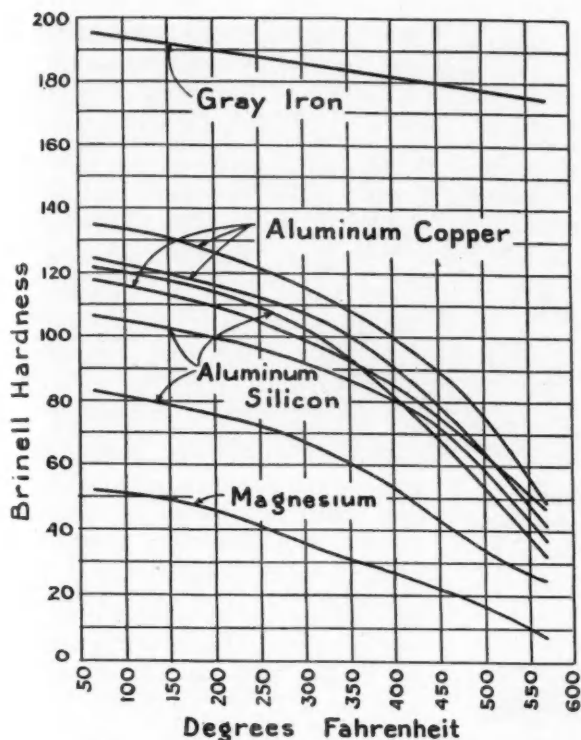
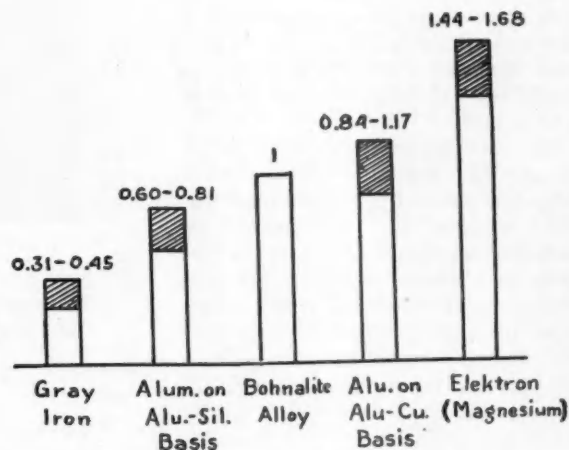


Fig. 5—Effect of temperature changes on Brinell hardness of various piston materials (as determined in the laboratory of the Elektronmetall Company at Cannsatt between 1925 and 1930)

and ring grooves, as compared with a gray-iron piston or an ordinary light-alloy piston. With this construction, a gray-iron piston ring in a gray-iron hard ring carrier slides over a cylinder wall also of gray-iron. The well-known excellent bearing properties of gray iron therefore are fully taken advantage of for the specially critical field of the upper dead center, the first ring groove, and the piston ring. It may be observed that for many types of automotive Diesels the development of such a piston was an essential preliminary to further engine development, for gray-iron pistons, on account of their poor heat conductivity (heat

Fig. 6—Wear coefficients of different piston materials. The rate of wear is less the smaller the wear coefficient

(From a thesis entitled "Characteristics of Piston Materials with Special Reference to the Coefficient of Wear, presented in 1931 to the Aachen Technical College by Dr.-Ing. E. W. Koch.)



cracks, see Fig. 8), as well as on account of the generous dimensions necessitated by the extraordinary high pressures, and the great weights resulting therefrom, are unsuitable for higher speeds of revolution, while light-alloy pistons presented difficulties from the standpoint of a proper seal, after a mileage of only 25,000 to 37,500 (see Fig. 9), whereas with the carburetor engines of commercial vehicles it is customary to figure on a minimum of 60,000 miles before replacement of either gray-iron or light-alloy pistons becomes necessary. Today, fortunately, such remarks as those made, for instance, by G. Quarg, general manager of the Berlin Transit Company, in *Verkehrstechnik* of September 15, 1932, that "the life of the crank train at present is only about half as great on the average as in carburetor engines," may be said to apply only to the past.

It remains only to briefly discuss the different designs and the fields of application of the light-alloy piston with hard ring carrier. Fig. 10 shows the ring belt of a piston with hard ring carrier after

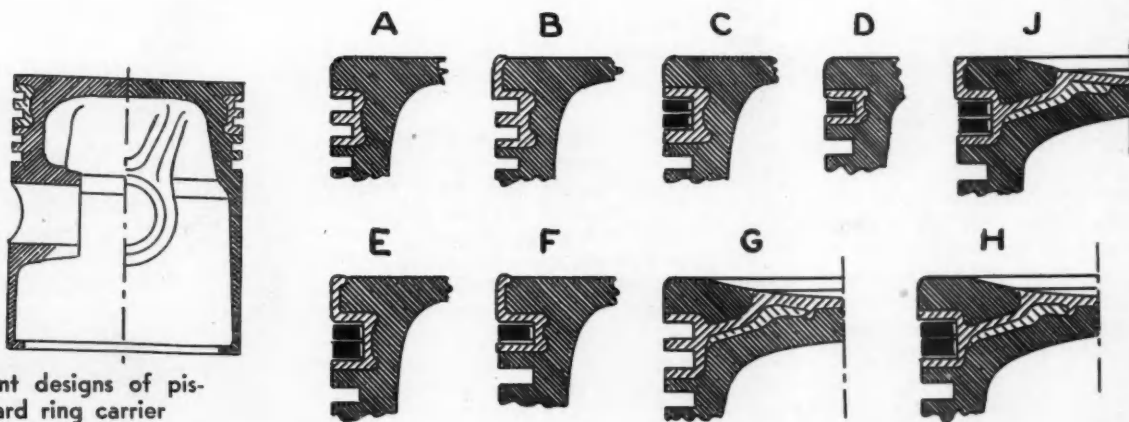


Fig. 7—Different designs of pistons with hard ring carrier

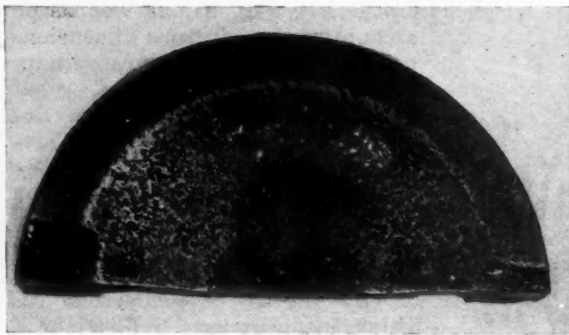


Fig. 8—Gray iron pistons of automotive Diesel of which the crown has been burned through

63,500 miles of service. The axial wear of the piston ring grooves is not quite 0.004 in.

The wear of the rings themselves, both radially and axially, was slightly greater than this. This is a desirable characteristic, for it is better that the cheaper part, that is, the piston ring, should wear more than the cylinder. Even after this mileage, the piston is still sufficiently good so that it can be put back in the engine without having any machine work done upon it, only the piston rings being replaced. Wear of the cylinder bore was so slight that there was no measurable increase in the oil consumption throughout the whole period of service, whereas ordinarily the oil consumption increases continuously with service.

If one figures on 60,000 miles of service previous to the first major repair of a commercial vehicle engine, and on four such periods as the entire life of the vehicle as a whole, it is now possible with pistons with hard ring carrier to go through this first period without difficulty, and after replacing the piston rings, another 60,000 miles can be completed. Then, while the cylinder liners are being replaced, the ring grooves can be recut and widened axially by 0.020 in., which will enable the piston to pass through the third service period, and after another replacement of the rings, the engine is ready for its fourth period of service.

The growing use of cylinder liners—in which England has been leading for years—and the excellent resistance to wear shown by such liners, together with their low cost, will make it possible either to entirely obviate the purchase of replacement pistons, or to reduce it to a minimum as compared with present practice. The slight extra cost of the piston with hard ring carrier, therefore, cuts no figure,

considering the extraordinary increase in the life of the pistons and the prevention of unnecessary repairs.

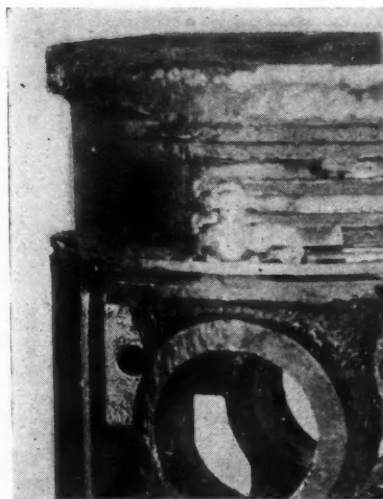


Fig. 9—Light-alloy piston of automotive Diesel of which the ring belt has been destroyed

Ring carriers can be applied to all of the different designs of piston, including the trunk, split-skirt

and invar-strut type, as well as to pistons of different alloys, such as Bohnalite, Lo-Ex, Y alloy, etc. Their application therefore is not limited to a particular design and alloy.

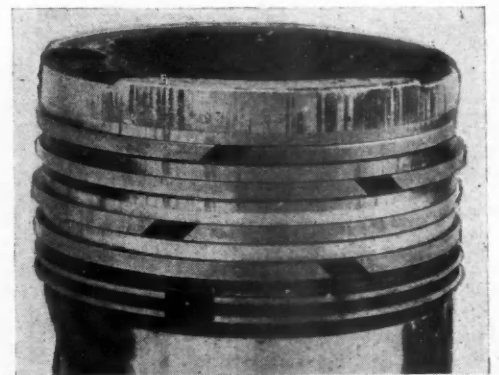
In Germany light-alloy pistons with ring carriers are already being fitted in stock engines by Daimler-Benz and Maybach; their use has increased rapidly recently and many thousands of these pistons are already in service.

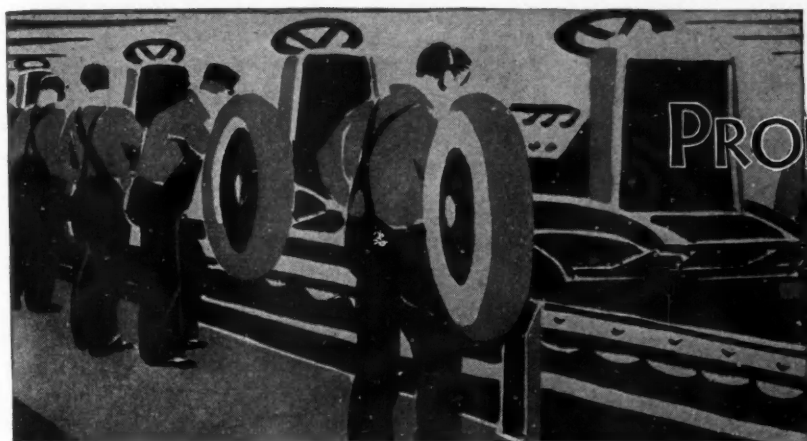
In view of the great variety of possible applications and of the space conditions that must be met, the various designs shown in Fig. 7 have been further developed. In some of the newer designs two narrow rings are placed in the top groove, which has the advantages that the rings stick less readily and that if one of the rings does not give a good seal at any point of its circumference, this is compensated for by the other ring in the same groove. In a piston for two-stroke engines, where the top edge, which controls the valve ports, is subjected to severe heat stresses, the hard ring carrier is extended to the top of the piston. Finally, in some pistons for Diesel engines of both the aircraft and truck types, the hard ring carrier is combined with a crown plate of the same material. In such engines it is desirable that the center of the crown be maintained within narrow temperature limits, and by varying the thickness of the crown plate it is possible to approach the crown-center temperature of either a gray-iron or a conventional light-alloy piston.

At the start, the principal market for pistons with hard ring carrier lies in those fields where considerable trouble has been experienced from insufficient life of pistons, but once the cost has been sufficiently reduced by quantity production, it will meet a demand also for ordinary services, where its advantages will be equally appreciated.

Fig. 10—Light-alloy piston of automotive Diesel with hard ring carrier after 68,500 miles of service

(State of the art in 1932.)





## PRODUCTION LINES

### Quicker Turnover

Because of low prices, excellent transportation facilities, and about three years of experience in getting along on small inventories, industry generally will continue to operate with small inventories than were considered sound ten years ago. This will reduce operating expense and enable all companies to turn their inventories two to four times more often per year than during the past ten years.—H. H. Krause, P. A., National Screw & Mfg. Co.

### Tentative Code

Help comes to those interested in welded steel construction for machine tool elements. On April 27, G. D. Spackman, president Lukenweld, Inc., presented to the American Welding Society for consideration a tentative code by which the designer, fabricator and buyer may be guided. It's a new art—threading uncharted waters. A good code, subject to change, marks a big step forward. More power to the committee.

### Eye Savers

From the Fourth Annual Greater New York Safety Conference come the following three ideas for safety engineer. \* \* \* "Eye equipment should be selected from the point of view of maximum protection and comfort. Eye protective devices may be divided, according to the hazard against which they guard, into four classes: impact, dust, splash, glare and injurious rays."—W. F. Weber, Western Electric Co.

### and Machine Guards

"... Machine and equipment hazards vary with different indus-

tries. In woodworking as much as 60 per cent of the entire cost may come from mechanical accidents. In the metals and metal working industries mechanical accidents run as high as 37 per cent for machine shops and 23 per cent for foundries. The records show that the accidents due to machinery generally cost considerably more than those due to personal causes because of increased severity. These figures I have given are measurements of accidents that are obviously mechanical in origin. We should remember, however, that mechanical safeguards will prevent many so-called non-mechanical accidents."—W. H. Cameron, managing director, National Safety Council.

### and an Unsleping Eye

"... An electric eye, operated by a beam of light in a hazardous position, interposes no obstruction which may get in the way of a piece-worker, leading to its being ripped out and leaving the situation more dangerous than ever. The beam of light is merely projected across the danger zone; as long as the beam is interrupted by the operator's hands being in the danger area, the machine will not start. Punch presses, shears, printing presses, and other machines can be so guarded."—O. H. Caldwell, editor, *Electronics*.

### More Uniform

A project to set up standard specifications and methods of test for non-shatterable and other types of safety glass has been started by the American Standards Association. It is hoped that a National standard will prevent costly conflicting requirements due to the regulations set up in various States.

### Anti-Knock Aircraft Gasoline from Coal

Following the recent announcement that the British Admiralty had placed an order for a 12-months' supply of fuel oil produced from coal, word comes from London that the Air Ministry has placed an order for a 12-months' supply of aviation gasoline of a new type made from coal. The gasoline is produced by Low-Temperature Carbonization, Ltd., and is a by-product in the manufacture of smokeless fuel. This coal gasoline is said to have the highest knock value of any aviation gasoline available in England, does not require the addition of dopes, and, unlike the anti-detonating fuels made by the cracking process, it has a negligible gum content.

### Real Protection

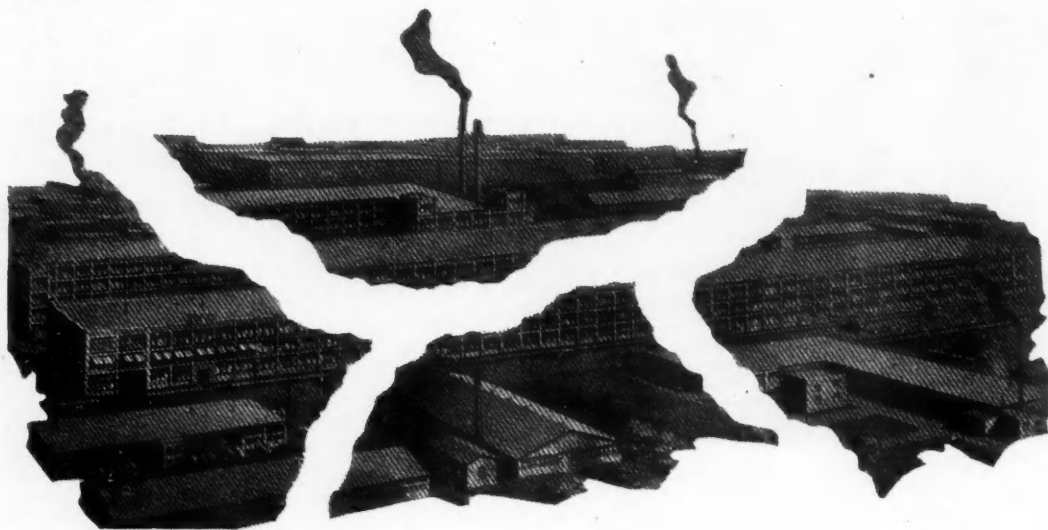
The Parkerizer reminds us that the fenders and other sheet metal parts of the new Ford are Bonderized for protection against corrosion. Parkerizing has proved of great value in other quarters. For example, it is found that molten metals such as tin, lead, and zinc will not adhere to a Parkerized surface. This has proved a boon in tinning connecting rods.

### Soup to Nuts

Not content to follow the parade, Cadillac has gone to Duco finish for running gear and other exposed parts, thus introducing a real lacquer ensemble—body, fenders, splashers, tire carriers, brackets. This change went into effect with the installation of a conveyORIZED Duco department handling 38 different parts including some under the hood. Apart from enhancing appearance, this change is expected to reduce the cost of repairs in process. All of these parts are Bonderized for complete protection.—J. G.







# Is Decentralization Industry's

**D**ECENTRALIZATION of industry—the shifting of industrial plants and industrial population to rural communities has fired the imagination of many business leaders. It has inspired editorials and created heated discussions at sessions of the engineering societies.

That the present Federal administration is solidly behind this movement is evident from an article by Raymond Moley, Assistant Secretary of State, in the June *Cosmopolitan*. In this article, entitled, "A Permanent Bread Line or Back to the Country?" Prof. Moley says in part, "What is planned is the growth of many small cities, containing a factory or a mill, or perhaps several, and surrounded by small semi-urban farms, most of them 'part time' farms. The population around these centers is to divide its labors between the factory and the farm."

With a national program of such proportions in the offing, it behooves industry to consider decentralization as a problem of immediate importance. It places particular significance upon the recent developments discussed in this article.

Is current interest in decentralization due to the present unprofitableness of large manufacturing organizations? Or is it due to some extent to the pressure of theories regarding the pleasant lot of labor cultivating the family

garden patch in between tricks at the machine?

No matter what the reason, decentralization or any other modification of our industrial system, if it is to be of any economic value whatever, will come about only as a result of irresistible economic forces.

Henry Ford's pronouncements in the daily press have placed a good deal of emphasis upon the current discussion of decentralization. He visions the time not so far distant when his gargantuan River Rouge enterprise will be dismantled—the time when the major units and parts for the Ford car will be manufactured in smaller specialized plants judiciously distributed in rural communities.

The first step along this road was begun with the establishment of assembly plants at strategic points both in the United States and abroad. The next phase in the experiment was the establishment at Nankin Mills, Mich., of a plant making screws. Valves have been made in another small town and there are now seven Ford village industries along the River Rouge.

According to Mr. Ford, about 5300 plants contribute to the building of the Ford car at the present time. Moreover, he implies that this number of independent producers is expected to increase greatly as time goes on. It is questionable, however, whether Mr. Ford's plan will encourage the growth of independent

producers since his ideas are said to contemplate active ownership and control of many of these units.

Parts makers will watch these developments with keen interest. If decentralization were to take hold generally or even in modified form, it should serve to stimulate the growth of the parts industry and perhaps give rise to many new organizations.

However, this would depend upon many ifs. Assuming some degree of decentralization, the growth of outside sources of supply would depend upon the degree to which the individual vehicle producer will be willing to break down or deconcentrate his present facilities. Further than this, it would depend upon whether the large vehicle maker would buy from independents or from closely controlled subsidiaries.

Whether decentralization of industry has a solid economic foundation; whether it is simply a palliative; or whether it is destined to be one of the key elements of our industrial system are moot questions at the moment. Needless to say, decentralization seems to imply concepts of great importance not only to the individual manufacturer but to industry at large. Obviously much of the value of the move depends upon whether it can be shown statistically that the smaller, more specialized plants can produce more economically and yield better and more stable profits than the larger units that have

featured industrial growth in recent years.

Other questions occur in this connection. For example—is the over-all investment for a given volume of production less with decentralized organization than with centralization? Is the investment more secure in a decentralized industry? And, will it yield a larger or more stable return—or both? If the answer to these questions is “No,” then it is difficult to justify decentralization on economic grounds. It may be said that decentralization would reduce the size of the individual “grief”

have already passed the point of greatest efficiency and greatest economic return.”

Here, again, is a point where the financial statement may be used as a gage in measuring the efficiency of the large and small manufacturer. However, isn't at least a part of the present unprofitableness of many organizations simply due to the abnormal pressure brought to bear by the forces of depression.

Of course, there are certain advantages that the small sized plant enjoys. Chief of these is flexibility. Usually it is unhampered

cient, there is no reason why its administrative expense and general overhead should be any higher in proportion than that of a smaller unit. Of course there is much room for improvement in the industrial organization today if the lessons of the present depression mean anything. For one thing, there is plenty of evidence on every side of a great wave of over-expansion both in productive equipment and floor space. This has constituted a terrible burden on costs in the last few years. Some manufacturers already have taken steps to write down a considerable portion of this burden.

Another mill-stone about the neck of many industrial establishments has been the continued maintenance of subsidized departments which do not earn their keep. Some manufacturers have taken the steps to throw these overboard, too.

Recent discussion stresses two basic concepts of decentralization. One is the *economic*; the other, *sociologic*. Apparently much ground must be plowed before the forces underlying these factors are brought to light. Yet industry cannot reasonably change its course before the needed facts and accurate statistics are known.

Thus the report on the President's Committee<sup>1</sup> sounds a note of caution, “At present we know but little of the action of the complex group of forces which has produced our present distribution of industry, and, of course, we cannot hope for any considerable control over them so long as this is the case.”

“\* \* \* this clearly indicates that the decentralization of population means more than decentralizing manufacturing. Offices (insurance, railroads, etc.) as well as factories must be moved into smaller communities.”

Sociologically, decentralization is held out to be one of the first steps in a new economic order. By locating in rural communities, the industrial plant permits labor to work under better living conditions, and enables the worker to cultivate a garden patch which is expected to take care of his immediate needs. How far this can go to alleviate the distress brought on by periods of slack operation is at

(Turn to page 588, please)

<sup>1</sup>“Slums, Large Scale Housing and Decentralization,” report by the President's Committee on Home Building and Home Ownership, pub. *National Capital Press*.

# 's Next Step?

The current already has started to run in that direction, but more facts are needed for a conclusive answer

by Joseph Geschelin

Engineering Editor, Automotive Industries

occasioned by cyclical changes such as we are now experiencing. But it should be remembered that a \$50,000 loss may be a bigger grief to a small manufacturer than a \$5,000,000 deficit is to a big company.

Dean Dexter Kimball, of Cornell University, has been one of the chief protagonists of decentralization. He is a firm believer in the smaller organizations and, on many occasions, has argued that some of our huge manufacturing plants are relatively inefficient. He says in *Mechanical Engineering*, “Lastly and most important of all, there are good reasons for believing that there are economic limitations to the growth in size of manufacturing enterprises and, consequently, to the efficiency of mass production itself. Indeed, if the facts were known, it probably would be found that many industrial enterprises

by the inertia of a large vertical organization. Decisions of importance can be made quickly and carried out immediately, while in larger organizations it is often impracticable. Thus, it is easier to trim to the winds of sudden change.

Even in the matter of flexibility there is really no reason why the smaller plant should have a monopoly of this vital spark. With good management it should be possible to allocate responsibility in any large organization so that needed changes can be made without much loss of time. In discussing decentralization people are prone to assume that the management of the small plant is always efficient and that the management of many large plants is frequently inefficient. This is by no means a sound foundation on which to build an argument for decentralization.

If a large manufacturing organization is well managed and effi-

<sup>1</sup>“The Social Effects of Mass Production by Dexter S. Kimball, *Mechanical Engineering*, February, 1933.

# Should We Try a PARTNERSHIP of

by Don Blanchard

Editor, Automotive Industries

**D**RIVEN and harried by three years of destructive price competition which, combined with declining volume, has eliminated profit and shrunk wages, business generally is more than willing to accept a measure of governmental control in exchange for a relaxation of the anti-trust laws which would permit cooperative effort toward rationalization. This was clearly evident in many of the sessions of the annual meeting of United States Chamber of Commerce held last week in Washington, where numerous important figures in the industrial and commercial world urged that business be given more latitude in the solution of its own problems.

While it was recognized that the further extension of government into business was fraught with some dangers, it appeared to be the quite general opinion that the disadvantages of such extension would be more than offset by the advantages. Moreover, there undoubtedly were many who believed with Gerard Swope, president of the General Electric Co., that "The attitude of the public and all evidences of legislation indicate that if industry can find a basis of agreement within itself, and move in the direction of self-imposed discipline and regulation, an opportunity will be given it to demonstrate how effective and constructive its leadership can be.

## Self-Regulation or Else—

"I have said before, and I repeat, that if industry does not see its opportunity and embrace it, it will be done from without. The alternative, therefore, is not shall it be done, but by whom shall it be done; shall it be done by the government with its necessarily more rigid procedure and therefore less efficiently, or shall it be done by industry itself, which knows its problems intimately,

taking the initiative and leadership, with the cooperation of the government to see that the public is protected."

## Governmental Planning Promised

That the administration is in sympathy with this viewpoint was indicated by the President's radio address on May 7, when he made it clear that the effects of destructive price competition on wages and hours of work had convinced him that business should be given the power to control recalcitrant minorities. Mr. Roosevelt said in part: "Well-considered and conservative measures will likewise be proposed which will attempt to give to the industrial workers of the country a more fair wage return, prevent cut-throat competition and unduly long hours for labor, and at the same time to encourage each industry to prevent overproduction.

"Government ought to have the right and will have the right," Mr. Roosevelt said subsequently, "after surveying and planning for an industry, to prevent, with the assistance of the overwhelming majority of that industry, unfair practice and to enforce this agreement by the authority of the government.

"The so-called anti-trust laws

were intended to prevent the creation of monopolies and to forbid unreasonable profits to those monopolies. That purpose of the anti-trust laws must be continued. But these laws were never intended to encourage the kind of unfair competition that results in long hours, starvation wages and overproduction."

What the effects of the changes the President has in mind will be on the automotive industry cannot be conjectured until the detailed legislation is available for study. Senator Wagner is reported to be working on a bill which would provide for a federal control board to supervise the cooperative efforts of industry working through its trade associations, and it is hoped that it will be released in time to include a résumé of it in the news section of this issue.

## Advisory Council of 21

Meanwhile a speech by Commerce Secretary Roper before the Chamber meeting revealed one avenue of administration thought. He proposed an advisory council of 21 to be selected by business on an industrial and geographic basis, which would advise with the government on economic policies.

Other speakers at the Chamber meeting who advocated relaxation of the anti-trust laws to give business greater freedom to regulate itself with a minimum of supervision by the government, were Henry I. Harriman, president of the Chamber, and Silas H. Strawn,

---

There is a widespread belief that an endeavor should be made to direct the course of business, at least partially, to cushion the effects of the blind functioning of the law of supply and demand.

---



# BUSINESS and GOVERNMENT?

## The Views of Industrial Leaders and the Attitude of the Administration

famous Chicago lawyer. Mr. Strawn asked "whether the time has not arrived when we shall have to depart from, or at least modify our economic policy of conserving only the immediate interest of the ultimate consumer . . . If we adhere strictly to the theory that competition must continue regardless of the fate of the producer, it may become so keen as to deprive him of any return on capital invested and deny a living wage to his employee . . . Cannot a saner solution be evolved by agreements which tend to equalize production and consumption to the general advantage?"

This viewpoint undoubtedly strikes a responsive chord in the minds of many business men. In today's restricted markets many have come to the conclusion that it is the producer who needs protection from the rapacity of his customers and his competitors instead of customers needing protection against producers.

### Minimum Wage Approved

It was a coincidence, of course, that General Motors' president Sloan's appearance before the House Committee on Labor to advise on the Black-Connery Bill limiting hours of work to 30 hours weekly and providing for minimum wages came during the Chamber meeting. As the representative of the N.A.C.C. he placed the stamp of approval of the motor vehicle manufacturers on the principle of the bill with the minimum wage feature, asking only that it be changed in detail to fit it better to industry's needs.

The same liberal attitude toward the administration's plans for experimentation in the labor field was

reflected by another leader in the automotive industry, P. W. Litchfield, president of Goodyear, who said at the Chamber meeting: "We are confronted by three years of evidence that conditions have grown steadily worse under the principle of individual initiative and that the efforts of the socially minded employer can be nullified by the greed of his competitor. Not many will contend that past policies are adequate to meet such a situation as we know to exist today regardless of our firm belief in the principle of individual initiative. If we are to save our traditional freedom for the future, it is probable that we must make substantial concessions to what we have in the past classified as the more radical school of thought."

### Controlled Competition

It is clear from the President's radio talk that to a degree "laissez faire"—the classical doctrine that everything will work itself out, if competition is free and unrestrained—is to be abandoned in favor of a measure of economic planning. What the ultimate effects of this break with tradition will be no one can guess. Previous experiences with efforts of this kind have not always turned out happily, but the march of events in recent years has prepared the public psychologically for a new experiment.

There seems to be little doubt that there is a widespread belief that an endeavor should be made to direct the course of business, at least partially, to cushion the effects of the blind functioning of the law of supply and demand. How successful such experiments will be depends very largely on whether

the crisis will produce political and economic leaders who are big enough and wise enough to cope successfully with so difficult a task.

### Economic Isolation

While an effort is being made to provide a stabilizer for the law of supply and demand domestically, Secretary of State Hull's speech before the Chamber indicates that the administration's foreign policy will be directed at permitting this law to operate more freely in international trade by removing or lowering some of the present barriers. The following expositions of his viewpoint is of particular interest to the automotive industry because of the importance to it of exports:

"It is now clear that no nation can live and thrive by itself. The proponents of the policy of economic isolation are now silent as to its world effect, but are still unable to offer any basic remedy for business recovery except this broken-down and discredited policy. They can only point to its colossal failure as a guaranty of its future ability to improve business conditions. And yet these blind forces of shortsighted isolation here and elsewhere continue to criticize and to ask a world which has become impoverished and bankrupt under their leadership to continue to heed them and their ruinous policies. The tragedy is that supine and credulous people in numerous countries today still allow them to conduct their governments under this policy of extremism, while all continue to slide further toward insolvency and economic ruin. The limitations of human suffering cannot much longer tolerate this suicidal leadership in any country."

# Is Decentralization Industry's Next Step?

(Continued from page 585)

present a matter for conjecture. Nevertheless, this sort of arrangement has been in effect for many years in industrial New England and other parts of the country, and deserves careful study.

In this connection the President's Committee recommends that—"Industry must look into the future and assume its proper responsibility for social and economic well being not only for the common good but also for its own security and continued growth. Study and observation point to the conclusion that the social order will be best served by a deconcentration of population, to which industry through its location holds the key. A deconcentration of population implies a decentralization of industry."

It may be reasonably asked whether it is the economic or the sociologic impulse that has actuated the discussion of decentralization. From the economic point of view, there may be many advantages in specific cases as, for example, lower taxes, lower realty values, and proximity to raw materials sources. But against these must be balanced the considerations of distribution costs, proximity to the market, transportation facilities, and the like.

Another very important consideration, no doubt is, that of cheap labor if rural workers are employed. However, the importance of this may be questioned in view of the intense mechanization in most mass production activity, which has resulted in an increasingly lower percentage of direct labor cost.

Moreover, the advantage of cheap labor may be offset by a narrow labor market tending to put the brakes on any sudden demand for accelerated production.

From a purely sociological point of view, there is much danger and certainly little security in establishing communities about only a single industry. It seems essential to have several diversified industries, so chosen as to iron out the seasonal variations in business activity, thereby absorbing most of

the local labor most of the time.

Incidentally, few if any of the investigators in this field of management have said anything concerning the attitude of the urban worker toward decentralization. Will he be interested in cutting the roots of the family tree and replanting them in the country far from his accustomed environment? How many are interested in, or fitted to, the rural scene and the garden patch?

Those investigating these new management problems warn against jumping at conclusions: careful and mature study are needed if we are to avoid the pitfalls that strew the road of experiment in human relations. Even our present institutions are not grounded on the precise scientific formulas that embellish the pages of management texts. For instance, we learn in the "Development of American Industries" recently reviewed in *Automotive Industries*, that the rea-

son for the concentration of the automotive industry in Michigan and Ohio is because its founders happened to live there. Also because the local bankers knew these men and were venturesome enough to back them.

Industry has too much at stake to overlook decentralization or the host of other economic questions which confront management today. And, as a matter of fact, the indications are that industrial executives are thinking and planning for the future in the hope of arriving at some satisfactory answer to the economic and sociologic questions that arise on every side.

But the conclusion is inevitable, that if we are to decentralize or make any other significant change in our economic institutions, it will be because of irresistible economic forces and not as a result of purely economic or sociologic theory. In fact, when the statistics arising from industrial operations during this past depression become available, much light will be shed on the problem discussed here.

We shall be in a position to know very soon just how the decentralized communities fared during the depression. Were they better off than other industrial centers? These statistics will be more telling than any amount of theory or conjecture.

## An Easy to Handle Insulating Material

SEAPAK is a new insulating material developed and marketed by the Seaman Paper Company of Chicago. Except for a thin membrane of paper on one side, it consists entirely of kapoc. The latter is the hollow silky fiber at the pod of the ceiba tree, which grows in certain tropical regions. It has been widely used for heat- and sound-insulating purposes, being valued on account of its light weight, its resilience, and its moisture resistance. Its drawback always has been the difficulty of handling it.

Seapak consists of kapoc in sheet form. It has proved of value to the aircraft industry as a heat- and sound-insulating material because of its light weight. It is made either plain, with the thin paper membrane only, or lined, using tough rope paper as a liner.

Plain Seapak is ordinarily made in two thicknesses, 90 point and

125 point (0.09 and 0.125 in.). The paper membrane is about 0.003 in. thick.

Rope-lined Seapak consists of the plain grade with a lining of tough rope paper on the face opposite that bearing the thin rag-paper membrane. This is made from ground-up ropes, the major portion ships' ropes, and is tough and compact, but when crumpled becomes soft, pliable and leathery. This grade comes in the same thicknesses as plain Seapak, but the rope liner can be made in a wide range of thicknesses.

The material is made only to order, and all orders must fill the width of the machine, which is 126 in., or must be combined with other orders to fill it or nearly fill it. Within the limitations of the machine fill, the rolls can be made in any width or in varying widths. The length of each roll is about 150 yards.



# Tests Show How Much Streamlining Car's Under-Portions Would Cut Drag

By Neil P. Bailey

**S**TREAMLINED automobiles produced during the past year, reflect determined efforts to improve the aerodynamic properties of motor cars by cleaning up the design of the bodies. But in spite of the care that is being exerted in streamlining the bodies and fenders, one look underneath will reveal that nothing has been done toward cleaning up the area that is concealed there.

An idea of the increase in wind resistance produced by this underneath area can be readily obtained from model tests in a wind tunnel. It is not necessary to make the model a reproduction of present body forms, as the purpose can be served equally well by a good streamlined aerodynamic model of the same proportions. Such a model with a smooth lower surface represents a completely streamlined body with a smooth lower surface. The same model with a depression in the lower surface approximately represents a streamlined automobile body with the lower surface unfinished. The difference between the aerodynamic drags of the two models is an indication of the gain that could be realized by cleaning up the under side of the automobile after a condition of good streamlining has been reached for the rest of it. Fig. 1 is a model which represents a streamlined body with a smooth lower surface, and Fig. 2 is the same body with a depression to represent an unfinished lower surface.

When testing such models in a wind tunnel, it is, of course, necessary to represent the effect of the ground surface. To this end an exactly similar model was placed upside down at twice this distance from the model to be tested. This gives air flow half way between the model and its image that is parallel to the lower surface, and accurately represents the case of the automobile moving over stationary ground through still air.

The models described were tested

at 76 m.p.h., using a balance sensitive to less than one-thousandth of a pound, and the results are shown in Fig. 3. When the models were separated from the ground by a distance equal to their height, the unfinished lower surface produced a 15 per cent increase in drag. When they were from  $2/10$  to  $3/10$  of their height from the ground, which is about the relation of an automobile body to the ground, this difference reached more than 30 per cent. With a smooth lower surface the drag decreased steadily as the model approached the ground. However, with the model having the unfinished lower surface, the drag increased for a while as the model approached the ground, and when quite close, started decreasing rapidly. The action of the model

indicated unstable flow and turbulence.

These results should not be interpreted as meaning that the total drag of an automobile could be decreased in this proportion by cleaning up the lower surfaces, because a well streamlined model was used, and the wheels and fenders were not present. However, it does indicate that the drag of the unfinished under surface of an automobile body is large enough that it should receive more attention than it has in the past.

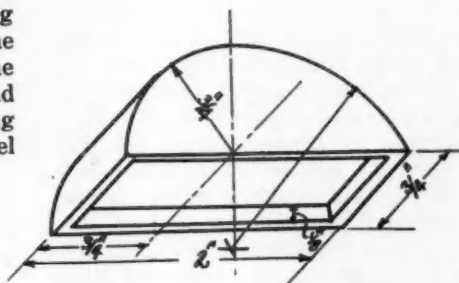


Fig. 2 (Above) — This diagram shows the same body as in Fig. 1 but with a depression to represent an unfinished lower surface

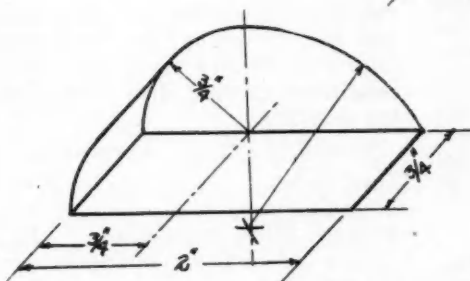


Fig. 1 (Above) — Shows a model which represents a streamlined body with a smooth lower surface

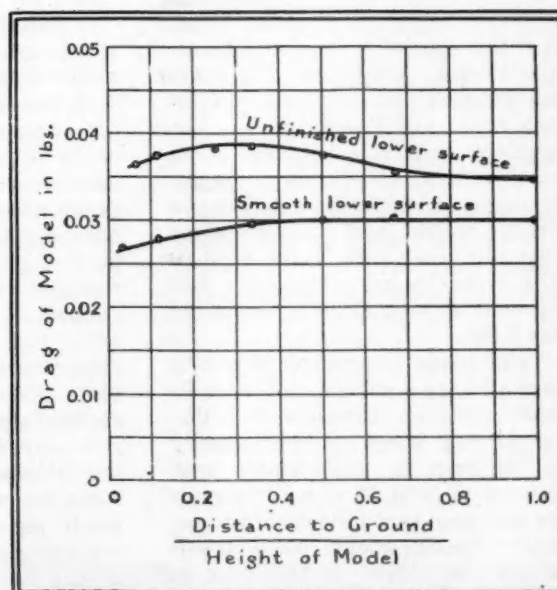


Fig. 3 (Right) — Wind tunnel tests made on the two models illustrated in Figs. 1 and 2 have been plotted on this graph. Air velocity was 76 m.p.h.



# The FORUM

## Test Shows Economy of Lower Axle Ratios

*Editor, AUTOMOTIVE INDUSTRIES:*

Referring to Mr. Heldt's article on lower-geared cars, in your April 15, issue, nearly two years ago we believed that we were in a position to accomplish the very objects discussed in that article, but by somewhat different means. In other words, having commercially developed and perfected a process for obtaining practically silent transmission gears, we designed and built a transmission having an over-drive gear for a 1931 Chevrolet two-door sedan. The performance of this car in over-drive was quite astonishing, and a most favorable impression was created in the minds of all those who drove the car. Following is a report on a test run with the car:

"On June 9 the writer started from Cleveland for Philadelphia in a 1931 Chevrolet two-door sedan, with the special three-speed transmission, with overdrive. The route was through Canada, Western New York State, and Pennsylvania. The overdrive gear was not used at all on this trip, all driving, except, of course, in starting, being done in direct, which had the standard Chevrolet rear axle ratio of 4.10 (the overdrive ratio was such that the total driving ratio in overdrive was 2.86).

"The roads covered on this trip were all hard-surfaced, and were in good condition throughout. The top driving speed in the country on the trip to Philadelphia was between 50 and 52 m.p.h. Sunoco gas was used throughout both trips, careful measurements being taken at various points of the trip to

check up the gasoline mileage. The car was greased and the engine oil was changed after 1000 miles.

### *Summary of Data in Direct Drive*

Total Miles .....	1068
Total Gallons Gas .....	65
Average Miles Per Gallon ..	16.4
Quarts of Oil to Maintain Level .....	2

"The return trip was made from Philadelphia to Cleveland over the Lakes-to-Sea Highway in Pennsylvania. The roads were practically in the same good condition as the roads on the Eastern trip, but there were considerably more and heavier grades. Overdrive was used whenever the speed was greater than thirty m.p.h., and was therefore in use over 75 per cent of the time. In view of the fact that the engine vibration was very much reduced by the use of the overdrive gears, the usual speed in country driving was between 55 and 60 m.p.h. Consequently, with the considerably increased windage losses, and heavier grades on the return trip, it is obvious that the driving conditions favored direct drive on the trip East.

### *Summary of Data in Overdrive*

Total Miles .....	766
Total Gallons Gas .....	40
Average Miles Per Gallon ...	19.1
Quarts of Oil to Maintain Level about .....	$\frac{3}{4}$

"From the data thus accumulated, which are accurate within plus or minus 3 per cent, it is thus seen that the use of the overdrive gears gave 18.5 per cent greater mileage, or in other words, the saving in gasoline due to the use of overdrive gears was 14.1 per cent. In round numbers this means that six gallons of gasoline used in overdrive will give the same mileage as seven gallons of gasoline in direct drive when touring, in addition to the remarkably increased driving comfort. Enough data have not been accumulated on oil consumption to give any definite figures, but the indications are that the oil consumption must necessarily be very much reduced by the use of the overdrive gears, especially in view of the fact that when the car is

going 60 m.p.h. in overdrive, the engine is turning over at a rate corresponding to only 42 m.p.h. in direct drive. It is a well known fact that oil consumption increases very rapidly at the higher speeds. It is also well known that engine wear and tear likewise increase very rapidly at the higher speeds. It is therefore reasonable to expect that the savings due to decreased oil consumption and decreased wear and tear of the engine by the use of overdrive gears will cause savings in dollars and cents, even greater, perhaps, than the savings in gasoline.

R. B. FEHR

## Streamlining Only Part of the Story

*Editor, AUTOMOTIVE INDUSTRIES:*

So many of your correspondents stress streamlining as the main advantage of the rear-engined car, whereas it seems to me to be an advantage distinctly secondary to several others which should be listed before it.

Burney has shown us how real riding comfort is to be had only in a rear-engined car, due to proper weight distribution, even with high-pressure tires. This advantage alone would justify the rear-engined car, as a huge improvement over the modern conventional car, even if it did not include a number of other advantages which seem to me to follow ease of riding in the approximate order listed herewith.

Reduction of noise and heat—these are left behind instead of being painfully obvious within the body, as in the front-engined car.

Recovery of the view of the front fenders—we will all appreciate the lessening of nervous stress and feeling of increased driving control when we can see the front fenders again.

Thus far I have listed the improvements, which I, as an owner, would enjoy in my cheap car and my neighbor would enjoy in his ex-

## A School for Body Draftsmen

Editor, AUTOMOTIVE INDUSTRIES:

Referring to the criticism in the issue of the *Automotive Industries* of April 8, 1933, and headed "Body Design Trends" I want to add a few words on a subject for which occasion seems to present an opportunity.

I want to bring forward the statement, that except for the Correspondence Course conducted by Andrew F. Johnson of Gray, Me., there is not in this country an opportunity for a young man to obtain the training requisite to becoming a body draftsman.

It is true that most of the factories make some provision to bring the young men along and fit them to take positions in their engineering departments. Admitting this to be so, this training cannot be as full and complete as he would obtain in some regular educational institution, also factory training will not develop initiative to the same degree.

During the days of the carriage and for a time after the motor car superseded the carriage, there was a school in New York where body designing and drafting was taught. There is today in Detroit and New York, Alumni Associations of the former school and they have made repeated efforts to bring about duplication of the former opportunities for study, an opportunity open to any young man who feels that he wants to become a body draftsman and qualify in time as a designer. We are still hopeful that in the not too distant future, there will be either an institution devoted to the teaching of this art, or else that some accredited institution of education will add a course covering this study.

The members of the Alumni Association of the former school, will I feel certain get behind any effort that promises that the boys of today shall have an opportunity equal to that which they had.

GEORGE J. MERCER

pensive car. Now, as a designer, I can envision performance possibilities and mechanical means therefore which would give me and my neighbor still further satisfaction in the way of complete response of power to the accelerator pedal alone.

To begin, the rear-engined car precludes hand gear-shifting because of control difficulties. Therefore, it must have an automatic transmission. This being so, there is no longer any limitation by human element to three speeds, but instead, the performance possibilities of four, five or even six speeds are immediately available. We know that an expert driver can do wonders with a small engine and five speeds, as in European road racing, by keeping the engine speed and power up with a gear-ratio suitable to each condition of load. But expert drivers are rare. In fact, even an expert may be bored by frequent gear-shifting if no prize is in sight, and certainly John Public shows magnificent indifference to the beauties of the four-speed models which are frequently put on the market and are frequently withdrawn when they don't sell.

Now we need only to resort to the old dodge of making a virtue of a necessity, accept the necessity of an automatic transmission, give it the virtue of four, five or six speeds and behold! we have a real engineering achievement in the way of plenty of power from a fast-running, moderate-sized engine when the demand arises, together with its reduced weight and economy of oil and fuel, the latter especially true with the engine loafing along in high gear when the demand is light, as it is so much of the time. Of course, such an automatic transmission must respond to the driver's wishes for more or less power and speed as expressed by nothing more than the increased or decreased pressure of his foot on the accelerator pedal. Then, at last, we shall have a car of more than three speeds which the layman will buy, and use efficiently, merely because he can't help using it efficiently.

Another necessity which we can convert into a virtue is independent rear-wheel suspension, and while we are at it the front ones might as well go along. There is a lot of unsprung weight to be saved by independent suspension, and a lot of vertical acceleration of the passengers. By development of proper weight distribution and springing we can probably avoid asking the tires to do it all, and so keep away from the overstuffed effects which threaten us.

Finally, because we can't find much else to rank ahead of it, we have streamlining. The rear-engine car lends itself to streamlining better than the front-engined car, not because we can attempt a pure tear-drop profile, but mainly because we have a place to put the spare tires under cover in the natural box bounded by dash, radiator and front fenders, after taking the engine out of it, and still have them fairly accessible. Then a little more slope at the rear of the body than on the present new models, and we have about all the streamlining that John Public is apt to need at his usual driving speeds.

Even the finest lines are no good to him much under 40 m.p.h., so that he would have to drive pretty fast to realize any substantial economies of power from streamlining. In contrast, he does all of his accelerating under 40, and then is when he wants plenty of power, so it all has to come out of engine ability; hence my boosting for a very flexible transmission and the soft-pedaling on streamlining. Incidentally, it is just as well that I get in my little two cents about streamlining right now, because after the advertising and sales departments get going really good on it, you wouldn't be able to hear a designer's voice above the uproar of the noisier brethren.

FRED C. BOOTH



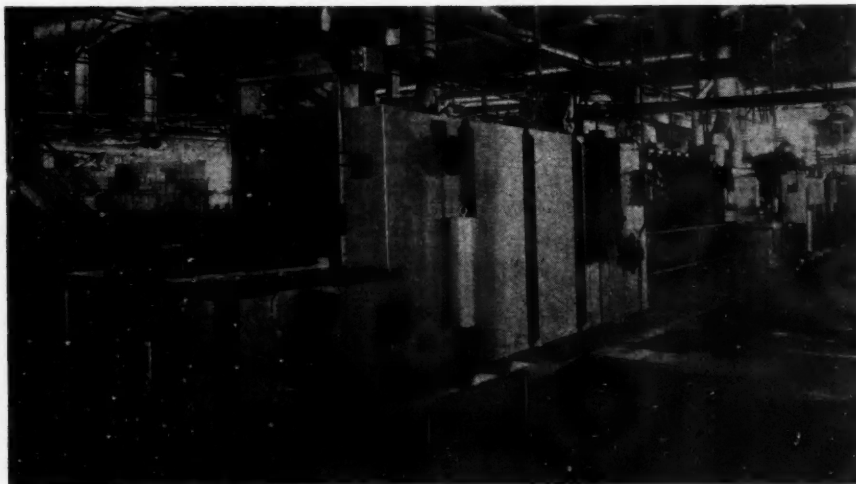
# NEW DEVELOPMENTS

## Automotive Parts, Accessories and Production Tools

### Eaton Heat-Treating Oven

An automatic electric heat-treating furnace for coil springs is now being used by the spring division of Eaton Mfg. Co. in Detroit. It consists basically of four synchronized

elements baffled in the side walls, with circulation of air upward past the heating elements and down through the conveyor carrying the springs. This circulation is controlled by four fans at the top of the furnace. Speed of all conveyors con-



units, the first of which is a hardening furnace through which the coil springs pass on a cast Link-Belt conveyor.

The hardening furnace is of the triple zone type for gradual raising of temperatures under pyrometer control. From this furnace, without being exposed to the atmosphere, the springs are dumped into an oil quench. A conveyor gathers them in this bath and passes them through a washer into the drawing furnace.

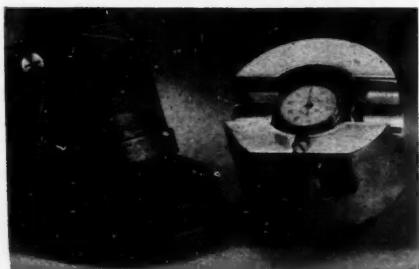
This latter furnace has the heating

trolled through variable speed transmissions.

At the dumping end of this furnace is a blower so arranged as to prevent natural drafts entering the furnace. The set-up is a product of the Electric Furnace Company. It is designed for a 600 lb. per hr. capacity, from a heat standpoint. Practical capacity using coil springs is in the neighborhood of 400 lb. per hr. The primary advantage of heat-treatment after forming of coil springs is greater resistance to fatigue failure.

### Westinghouse Vibrometer

A new vibrometer for field and service work and for general testing is announced by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. It is said to be specially adapted for studies on small machines or where the clearance is limited.



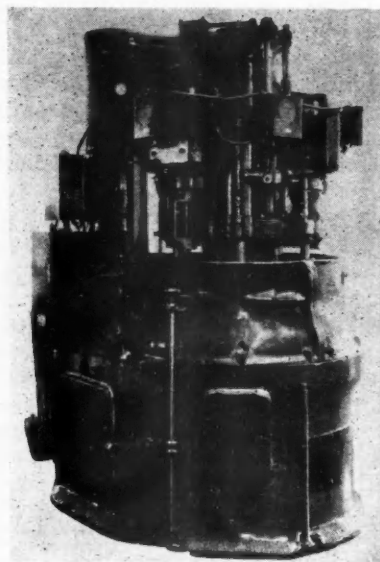
The instrument consists of a flexibly supported mass, and a dial indicator fastened to the end of a thumb screw and supported by the mass to measure the amplitude. Vertical movements are measured with the adjustment shown in the photograph, but for indications in the other two principal planes the dial indicator is turned through 90 deg. by means of the thumb screw. To facilitate this adjustment the end of the indicator bears on a circular block. The dial is read through the cutaway portions of the mass by sighting from the side. Laboratory tests show that the vibrometer is reliable for frequencies as high as 6000 r.p.m. when the amplitude does not exceed 0.004 in., and at lower speeds for much higher amplitudes.

There is also the added advantage of obtaining these coated steels in long continuous coils which can be fed into a punch press or forming device in a continuous manner and with minimum expense.

### Baird Automatic Multiple Grinder

An eight-spindle internal grinder just developed by the Baird Machine Co., Bridgeport, Conn., should be of interest to those having internal grinding on a large quantity basis. There are six grinding stations and two stations that may be used for loading and unloading, or one may be for this purpose and the other arranged as a polishing, gaging, or testing station. In this machine the wheels do not have to be the same size nor are they dressed alike. Each wheel is automatically dressed and sized according to its need, independently. The speed and feed of each wheel is independent of any other wheel. Also any grinding wheel may be replaced at any point in the cycle without disturbing any other wheel.

Roughing and finishing wheels may be used. Holes of different diameters may be ground at one set-up. Machine may be arranged to operate double indexing so that a piece of work may be first ground from one end and at the second pass ground



from the other end, or two pieces may be unloaded and loaded at each cycle of operations.

The machine takes a floor space of about 74 in. x 61 in. It weighs about 27,000 lb., requires about 7½ horsepower for the machine and 2 to 3 horsepower for each wheel, depending on the job. Totally enclosed mechanism, anti-friction bearings, automatic lubrication, and automatic safety controls are provided. The capacity is for work up to 11 in. diameter.

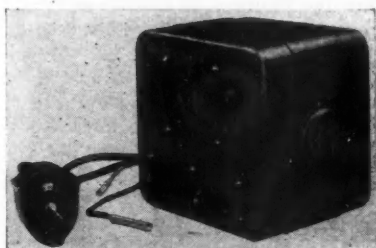


## Automobile Radio in a Single Unit

A radio receiving set with dynamic speaker, all contained in a single metal case no longer than the average automobile heater, and which can be attached to an automobile with only one bolt, has been announced by the General Electric Co. It is connected to the car battery at the ammeter, and requires no additional batteries. A remote control box can be clamped in any position on the steering post or on the instrument panel, within easy reach of the driver.

Ignition interference has been eliminated by double shielding of the vibrator power supply, complete shielding of the entire equipment, and use of a tone control to reduce noises met with in noisy locations.

The set is mounted on a single stud, needing only one-half in. hole in the bulkhead of the automobile for mounting. There is a new vibrator type of B battery eliminator, doubly shielded, and three of the four tubes are of new types. These are a radio



New G.E. Model B-40 Super-heterodyne Auto Radio

frequency exponential pentode, type 78; a seven-element type 6A7; and a duo-diode pentode, type 6B7. The output tube is a type 89. The use of tubes with multiple functions is said to result in seven-tube performance with a four-tube set.

There are automatic volume control and two-point tone control. The control box is fitted with a lock switch, the key being used also to operate the manual volume control. If servicing is required, the entire set is easily removed from the mounting plate by removal of six screws.

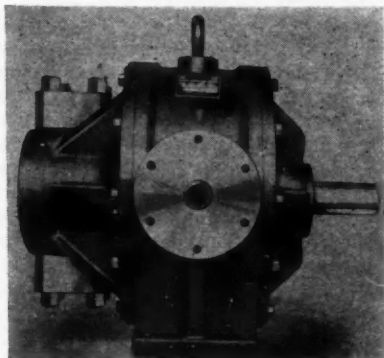
## Pump Provides Hydraulic Power

The Hydraulic Press Manufacturing Company, Mount Gilead, Ohio, announces a complete series of radial pumps for generating pressure in operating hydraulic powered machinery. Such presses and machine tools, also welding machines, steel mill machinery, testing machines, and many others.

This pump is of positive displace-

# NEW DEVELOPMENTS

## Automotive Parts, Accessories and Production Tools



Radial pump made by Hydraulic Press Mfg. Co.

ment, multiple radial plunger, oil pressure type in which a number of new and important inventions are said to be incorporated. The output is both variable in volume, and reversible in direction of flow, which characteristics are utilized to full advantage with the aid of H-P-M Pump Controls.

These pumps are built in six sizes, ranging from 1 GPM per minute to 100 GPM per minute, with pressure capacities up to 3000 lbs. per square inch, to meet every machine drive requirement. All features of the design are covered by patents or pending applications.

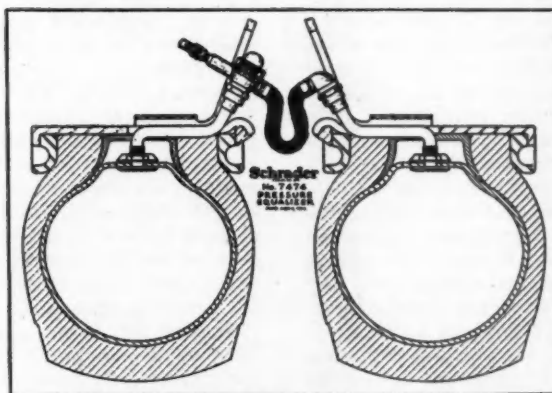
## Equalizes Pressure of Dual Tires

A device designed to equalize the pressures of dual tires has been developed and placed on the market by A. Schrader's Son, Brooklyn, N. Y. It has been found that the inner tire of a pair of duals usually carries the higher pressure, which may be due to excessive heat from brake drums, to lack of ventilation, to extra friction on strongly crowned roads, or to improper inflation. If there is considerable difference in the inflation pressures, one of the tires naturally will bear more load and wear more rapidly.

Tire pressure equalizers, we are informed, have been under development for a long time. In the early devices,

however, no provision was made for shutting off communication in the event one tire went flat. The Schrader pressure equalizer incorporates a safety valve which enables one of the tires to take the load when the other goes flat.

The Schrader pressure equalizer is claimed to offer the following advantages: It enables dual tires on the same unit to equalize their pressures as long as these are above a certain predetermined minimum. It provides an automatic safety valve which retains a predetermined pressure in one tire in case of blow-out or puncture of the other. Both tires may be quickly inflated and gaged through a single valve mouth equipped with the Dubl-check cap. A flexible armored hose and swivel connections make application of the equalizer quite easy.



Sectional view of twin tires equipped with Schrader pressure equalizer

## Ford to Spend Half Million in Campaign

Uncertainty Continues  
as to His New Model  
and Production Plans

DETROIT—More than half a million dollars will be spent in the next few weeks on the advertising campaign which the Ford Motor Co. launched early this week. It is expected that the major share of this appropriation will be used for institutional copy similar to that appearing in the first advertisement released, but it is possible that a portion may be devoted to car and truck advertising.

Much uncertainty exists here regarding Ford's new model plans and his production and purchasing policies, although it is felt in some quarters that important changes in set-up impend. Machinery in fairly large quantities has been moved into the old Highland Park plant in the last week or so. Moreover, several parts suppliers have reported that Ford is contemplating cancellation of contracts for the supply of some materials. Whether this means that Ford is considering making more of his own parts cannot be ascertained, but there is a disposition to regard the rumored move in this direction as a

gesture to secure more favorable contracts over a period of time. Ford generally does not commit for more than 30 or 60 days and any rapid increase in material prices would be disadvantageous to him.

The current advertising campaign, incidentally, is being handled through the Ayer agency, thus setting at rest reports of a severance of this agency's relations with the Ford company.

## Chrysler Royal Eight 7-Passenger Sedan

DETROIT—A new Chrysler seven-passenger sedan, listing at \$1,195, has been brought out on the Royal Eight chassis lengthened to 128½ in. wheelbase. The price includes an option of five-wire or five demountable wood wheels. Tires on this model are 6.50 x 17, 4 ply, the rear springs are heavier and front double acting, inertia type shock absorbers are provided.

## Pierce-Arrow Reports

BUFFALO—Pierce-Arrow sustained a net loss after charges of \$259,505 in the first quarter of 1933, as compared with a net loss of \$193,534 in the corresponding 1932 quarter.

## Sloan Puts N.A.C.C. Approval on Principle of Maximum Work Week with Minimum Wage

WASHINGTON, D. C.—Recording himself as a "most sympathetic advocate of the share-the-work principle as an emergency measure," General Motors president Alfred P. Sloan, Jr., appearing as spokesman for the N.A.C.C., urged upon members of the House Committee on Labor the necessity of flexible provisions and a minimum wage if the Connery-Black Bill is to be made an effective instrument in increasing work.

Mr. Sloan estimated that with such amendments the bill might afford employment for about 750,000 persons. To be made effective on a large scale, he suggested that its provisions should be extended to include all kinds of public and private employment both in intrastate and interstate operations, with the exception of agricultural and household workers.

As a practical and essential means of meeting the highly seasonal conditions which exist in many industries, Mr. Sloan advocated a maximum day of eight hours for six days or a maximum week of forty-eight hours.

By limiting the total maximum hours of labor for any one individual in any one year to a maximum of 1664 hours, he said, this provision would work out to an average employment of thirty-two hours per week as

against the thirty hours per week contained in the Black bill.

In defining the categories of labor who should be included, Mr. Sloan laid particular stress on the necessity for distinguishing as between non-productive and productive labor, pointing out that only those actually engaged in production should come under the bill if it is to be made practical.

Incidentally, Mr. Sloan said that while he favored a proposal of the kind outlined as an emergency measure, he was opposed to it as permanent legislation, saying that as long as we live in an unfinished world, over-production of most articles of commerce will be impossible.

Warning the committee of the dangers to American export trade as well as to necessary imports if foreign-made goods should be brought under the bill, Mr. Sloan recommended that such a provision, if applied, should only be used after convincing evidence of its desirability from the standpoint of American economy.

Besides Mr. Sloan, chairman, members of the committee representing the N.A.C.C. were A. C. Brown, Dodge Brothers Corp.; J. B. Graham, president, Graham - Paige Motors Corp., with M. E. Coyle, vice-president, Chevrolet Motor Co., as adviser.

## Tire Makers Near Capacity Output

Goodyear and General Plants  
on Four-Shift Basis—Other  
Makers Expanding Production

AKRON—The steady increase in automobile production coupled with the seasonal demand for replacement tires and tubes is reflected here this week by a return to almost boom time production schedules by leading tire manufacturers.

Goodyear, largest of the tire factories, returned to a full time schedule of production early this week for the first time in many months. The company is now operating four six-hour shifts for six days a week and expects this schedule to continue for several months on the basis of accumulating orders.

Company officials announced that 1500 former employees, some of them without work for months, have been recalled to work since April 1. Of these 500 were recalled Monday, 500 had been recalled earlier this month and the other 500 during April.

General Tire & Rubber Co. celebrated the return to capacity production a week ago, and is also operating four six-hour shifts daily for six days a week.

India tire has stepped its production up this week from 1400 to 2000 tires a day, and Seiberling has made a 100 per cent increase in production schedules during the past month. Goodrich, Firestone and Master have reported steadily increasing schedules of production for the last six weeks.

Heavy duty tires, the more expensive kind, and truck and bicycle tires are in greatest demand at present, Goodyear announced.

## McCuen Heads Olds Engineering

DETROIT—John G. Wood has been appointed assistant chief engineer, Chevrolet Motor Company. Mr. Wood is succeeded by C. L. McCuen as chief engineer of Olds Motor Works.



# WS

## May Retail Sales Get Off to Fast Start After April Volume Upswing to 150,000

Continuing Demand Makes May Output of More Than 200,000 Probable—Production in Step with Sales and Used Car Stocks Far Under '32

By Athel F. Denham

Field Editor, Automotive Industries

### Three Chevrolet Plants Assembling Pontiacs

DETROIT—During the past several months Pontiac cars for the Southeast and Pacific Coast regions have been assembled at the Atlanta, Ga., and Oakland, Calif., plants of the Chevrolet Motor Co. The successful operation at these two points has led to an expansion of this activity with Tarrytown Chevrolet plant also taking over assembly of Pontiacs for Middle Atlantic and New England states.

### Michigan Registrations Gain 25% on March

April Michigan registrations, while still lagging behind last April by 15 per cent, showed an increase of roughly 25 per cent over March, mainly due to increased sales in Wayne County, where Ford was a heavy factor, recording an increase in sale for the State of 35 per cent over March. Registrations totaled 4365 passenger and 292 commercial.

### Otis Succeeds Zucker

CHICAGO—Election of John E. Otis, Jr., as vice-president and general manager of Stewart-Warner Corp. and its subsidiaries was announced this week. Mr. Otis has been vice-president and general manager of the Alemite Corporation, Stewart-Warner subsidiary, since 1923. It was also announced that F. A. Hitler, general sales manager of the Alemite Corporation, has been promoted to the same position with the parent company.

W. J. Zucker has resigned as vice-president and sales manager.

### Illinois Sales Ahead of 1932

CHICAGO—Aided by increased buying in downstate communities, new car registration in Illinois during April topped those of a year ago. On the basis of reports from every county in the state, new car sales in April totaled 8132 cars as against 7892 in April, 1932.

DETROIT—Domestic retail sales for April totaled between 148,000 and 150,000 according to estimates made by *Automotive Industries*, based on returns from approximately 85 per cent of car dealers in the United States. This total includes Ford and Chevrolet trucks and compares with roughly 138,000 in April last year, a gain of 15 per cent. Retail sales therefore, are keeping directly in step with increases in production recorded so far this year. It is doubted whether new car registrations will show anything like this figure, however, due to the larger lag between sales and registrations which has made itself evident this year.

The sharpest rise in retail sales of the year so far recorded during the closing week of April was carried forward into the first week of May, and if continued will require an increase in production schedules for a number of important manufacturers. Unless there should be a sharp decline in dealers' orders toward the end of the month, production will definitely be in excess of the 200,000 units estimated last week compared with 193,000 in May last year.

Several manufacturers have already jumped May production schedules, including Pontiac and Oldsmobile; the latter to 4500 from original schedule of 3500.

A healthy factor in the retail picture is that used car stocks as of May 1, totaled roughly 35 per cent less than on May 1 of last year, while

dollar volume of used car stocks has shown an even further shrinkage. While a slight increase in used car stocks was experienced during April, the rate of increase was considerably below the normal seasonal rate in spite of the large volume of new car sales.

This rapid movement by dealers of used car stocks helps to explain the fact that demand for the lowest priced lines of the large volume manufacturers, such as the Chevrolet Standard Six, the Plymouth Standard Six, the standard Ford models, etc., is considerably below expectations, deluxe models far outselling the cheaper companion cars. Sales of the latter seem to be confined very largely to fleet buyers who pay cash for new cars.

Some individual domestic sales reports for the month of April follow:

Chevrolet, 53,936, of which 23,000 were recorded in the last 10 days. Plymouth, 14,818.

Dodge, 6894, including cars and trucks.

Oldsmobile, 3776, of which 1627 were sold in last 10 days.

Buick, 4786, including 1978 in the last 10 days.

It is noted that the class immediately above the lowest price field is showing the greatest percentage gain in retail sales. Dodge and Pontiac together, for instance, are registering roughly 11 per cent of the total volume as compared with 8.5 per cent for the same period last year.

## 1933 Models Average 14 Per Cent Heavier But Are Priced 28 Per Cent Lower Than in 1926

PHILADELPHIA—The average 1933 five-passenger, four-door sedan weighs 14 per cent more than the average 1926 sedan and is priced 28 per cent lower. On the basis of cost per unit of weight, the price per pound of the average sedan in 1926 was 63c. while this year it is only 40c., a drop of

36.5 per cent in the last seven years.

The following tables show the changes classified by price groups in average weight, average price and average price per pound of the 1933 four-door sedans as compared with similar body types in 1926, 1929 and 1932.

PRICE CLASS	PRICE PER POUND —Cents				AVERAGE WEIGHT —Pounds				AVERAGE PRICE —Dollars			
	1926	1929	1932	1933	1926	1929	1932	1933	1926	1929	1932	1933
Under \$ 750	30	26	23	22	2137	2453	2770	2591	632	647	648	573
\$ 750—1000	37	33	28	27	2470	2750	3180	3359	905	907	883	903
1000—1500	43	43	35	32	3030	3167	3550	3794	1310	1372	1230	1225
1500—2000	56	49	40	39	3330	3520	4250	4462	1875	1715	1700	1747
2000—and up	81	74	68	64	3870	4260	5040	4968	3140	3140	3410	3167
Average all cars	63	54	45	40	3330	3470	3840	3793	2100	1989	1725	1509



# Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

A moderate upturn in general business was noticed throughout the United States last week. The chief impetus to business has been the inflationary legislation passed by Congress, and it is impossible to say how much of the increase is the result of an anticipation of higher prices and how much is based on an improvement in the fundamental economic structure of the country. It is definite, however, that the country's business, with low inventories, strengthening confidence, and an improved banking situation, has been in a position to start toward recovery for some time. One of the most encouraging features of the current situation is the steady improvement in steel output, which has more than doubled in the last month.

## Freight Loadings Jump

Railway freight loadings during the week ended April 29 totaled 535,676 cars, which marks an increase of 42,706 cars above those during the preceding week, but a decrease of 18,521 cars below those a year ago and a decrease of 239,066 cars below those two years ago.

## Power Production

Production of electricity by the electric light and power industry of the United States during the week ended April 29 was only 1.8 per cent below that a year ago.

## Crude Oil Up

Average daily crude oil production during the week ended April 29 amounted to 2,383,100 barrels, as against 1,797,500

barrels for the preceding week and 2,177,500 barrels a year ago.

## Bituminous Coal Production Steady

Production of bituminous coal during the week ended April 22 amounted to 4,634,000 tons, as against 4,864,000 tons during the preceding week and 4,736,000 tons a year ago. Production of anthracite amounted to 569,000 tons, as against 717,000 tons during the preceding week and 1,406,000 tons a year ago.

## Fisher's Index

Professor Fisher's index of wholesale commodity prices for the week ended May 6 stood at 59.2, as against 58.6 the week before and 57.1 two weeks before.

## Stocks

The stock market last week was buoyant, and rapid advances in prices occurred. There was some liquidation from time to time that caused moderate reactions, but the offerings were well absorbed and the general trend of the market continued upward.

The consolidated statement of the Federal Reserve banks for the week ended May 3 showed an increase of \$15,000,000 in holdings of discounted bills and a decrease of \$33,000,000 in holdings of bills bought in the open market. Holdings of Government securities remained unchanged. The reserve ratio on May 3 was 63.5 per cent, as against 62.7 per cent a week earlier and 61.5 per cent two weeks earlier.

## Plymouth Retail Sales Gain 61% Over March

DETROIT, May 8—H. G. Moock, general sales manager, Plymouth Corporation, has reported that sales of the new deluxe and standard Plymouth sixes for April show a 61 per cent increase over the previous month.

Sales during April totaled 14,818 units, compared with 9212 in March. Plymouth sales for the week ending April 29 totaled 4555 cars which is a 23 per cent increase over the previous week. April sales were also 16 per cent ahead of the same month last year, Mr. Moock said.

## Packard Cuts Loss

DETROIT—A net loss of \$1,131,823 was sustained by the Packard Motor Car Co. in the quarter ended March 31, 1933, as compared with a net loss of \$1,563,983 in the corresponding 1932 quarter. The current ratio at the end of the quarter approximated 11 to 1 as compared with 8.8 to 1 at the end of 1932. The company has \$2,986,389 free cash in bank, \$8,244,736 U. S. securities and \$783,848 of the municipal, state and Canadian bonds. The company has \$894,000 in closed banks against which it has established a reserve of \$1,000,000.

## Graham Defers Exchange

DETROIT—At the request of the management Graham stockholders voted to defer action on the proposal to exchange three shares of the present stock for one share of new stock. In *Automotive Industries* of April 29 it was erroneously stated that the exchange proposed was on a share for share basis.

## Federal Sales Gain

DETROIT—April showed an increase in Federal truck sales of approximately 40 per cent over that of March, and was the best business month since April last year. The first few days of May would indicate that the upward trend is definitely with us.

## New Vest-Pocket Car

WASHINGTON, D. C.—France's latest contribution to the "vest-pocket" automobile market is a 5-horsepower, 2-passenger convertible cabriolet, recently announced by Amilcar, well-known producers of baby cars, according to a Commerce Department report.

The new midget automobile, which sells for approximately \$490, has a wheelbase of slightly more than 6 feet, it is reported, and is considerably

smaller than the 7-horsepower model produced by the same company. Only one model is being made, the convertible cabriolet, it is stated.

## Black Holds Lead

WILMINGTON, DEL.—Black continues to be the most favored automobile color, being about twice as popular as blue which ranks second, according to the Duco Color Advisory Service. Following in order are maroon, grey, green and brown.

## Rim Inspections Gain in April

CLEVELAND—Rims inspected and approved in April numbered 898,318 against 679,174 a year ago, an increase of 32 per cent, the Tire and Rim Association announces. For the first four months of the year rims inspected amounted to 2,552,000 against 2,864,108 in the corresponding period of 1932, a decline of 11 per cent.

May 13, 1933

Automotive Industries

## N. I. A. A. Plans Big Chicago Convention

**Three-Day Meeting in June to Include Large Exhibit of Industrial Advertising**

CHICAGO—Sales and advertising executives in all fields of industrial marketing will be interested in plans for the eleventh annual convention of the National Industrial Advertisers' Association at Chicago in June. With headquarters at the Medinah Athletic Club, the conference will cover three days, June 26 to 28, and will include an extensive exhibit of successful industrial advertising on many products. Industrial executives in all fields are invited to attend the conference and exhibition regardless of whether their organizations are members of the association.

How advertising is meeting present day problems is to be the theme of the conference. Outstanding leaders in the industrial field will discuss many phases of industrial sales work. Bennett Chapple, vice-president, American Rolling Mills Co., in an address, "What I Have Learned About Advertising During the Depression," will present many practical suggestions relating to present day sales operations. William L. Rickard, president of Rickard & Co., will present the viewpoints of the oldest, and one of the largest, industrial advertising agencies, on the problem of marketing industrial products. Arthur C. Nielsen, president of A. C. Nielsen Co., who has completed many successful market surveys for a number of the countries largest firms, will present an illustrated discussion of the principal features of market research. In addition to the general addresses there will be clinical sessions at which publication advertising, direct mail, house organs, visual presentations for salesmen, and similar subjects, will be analyzed from a practical standpoint by means of specimen material.

Forest Webster, Cutler-Hammer, Inc., who is president of the N.I.A.A., reports that one of the largest gatherings of industrial executives in the

history of the organization will participate in the conference.

The sessions will be held during Engineering Week of the Century of Progress Exposition. Some twenty of the national engineering societies meet in Chicago during the week and design production, advertising and sale of industrial products will come in for intensive study by the various groups.

## Studebaker Names Shorter

DETROIT—H. J. Shorter has been appointed manager of the newly-created Detroit Regional office of the Studebaker Sales Corp. of America, L. K. Manley, manager of branches announces. The new branch territory consists of Wayne County and 38 other counties in eastern and central Michigan.

Prior to his recent appointment, Mr. Shorter was special middle-western representative for Rockne. At one time he was assistant sales manager of Durant.

## Motors Gain \$617,000,000

NEW YORK—The market value of motor and accessory stocks on the New York Stock Exchange in April appreciated from \$880,000,000 to \$1,497,000,000, an increase of 70 per cent as compared with a gain of 34 per cent for the entire lists.

## Chrysler in Second Place

DETROIT—Sales of Chrysler, DeSoto, Dodge and Plymouth cars in the four months ended March 31 totaled 61,689 as compared with 48,549 in the same period a year ago. This record put Chrysler Corp. in second place for the period.

## Madison Appointed

BATTLE CREEK, MICH.—Harold B. Madison has been appointed New York branch manager of the Clark Tractor Co. Mr. Madison was formerly field engineer for the same organization.

## Metal Prices Firmer as Demand Increases

**Steel Buyers Accept Up Trend as Necessary to General Stabilization**

NEW YORK—Regular steel tonnage buyers were given every opportunity to cover their full second-quarter requirements at old prices before higher quotations were chalked up for most descriptions of flat steels. These apply for the time being to "new business" which is mostly of the small lot kind, and serve also as a basis for negotiations covering third-quarter shipments.

There is every indication that steel market leaders see eye to eye with the important steel consumers in the matter of prices. Rehabilitation of volume is not to be jeopardized by premature advances. Certain price adjustments had for a long time been anticipated by steel buyers who know that return to a sound profit basis for themselves implies that they must make like concessions to those from whom they purchase materials.

Some of the smaller rolling and finishing mills that have had a tough time riding out the depression are naturally unwilling to load down their order books with low price business and prefer, therefore, to await developments before committing themselves for the third quarter. The more speculative raw materials, especially scrap, are showing sharp price bulges and the effect of these on raw steel costs makes for special caution, especially so on the part of non-integrated rollers.

Automotive business, principally General Motors, Ford and Chrysler specifications, accounted for the greater part of the further expansion in steel mills operations this week. In the Cleveland district mills were operating this week at close to 50 per cent of theoretical capacity and in the Youngstown district at 35 per cent.

**Pig Iron**—Although actual price advances are so far confined to a mild upturn of foundry grades in some of the Eastern markets, the undertone is generally strong. Broadening of activities by automotive foundries has done away with all concessions. In the Cleveland market foundry and malleable are held at \$14.50, Lake furnace and \$15, furnace, for Cleveland delivery.

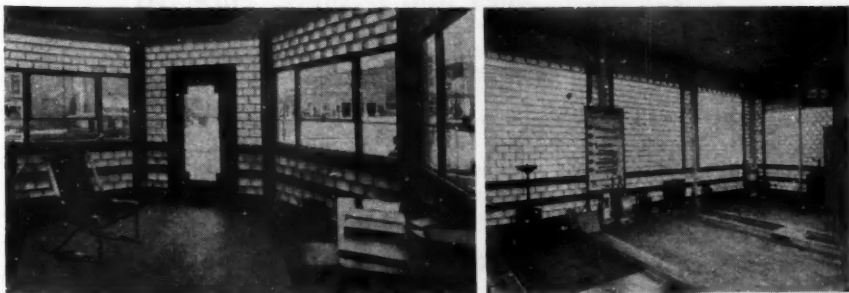
**Aluminum**—Steady and more active.

**Copper**—Prices of all brass and copper products have been advanced to conform to the 6½ cent price for electrolytic copper. Demand for automotive brasses has turned brisk. Further progress toward partial curtailment of copper output has been made.

**Tin**—A sharp rise in tin price at Singapore plus continuing high levels for Sterling exchange caused the week's opening quotation for prompt Straits to leap upward to 36 cents, compared with 25½ cents a month ago.

**Lead**—The leading interest announced an advance of \$3 a ton at the beginning of the week, lifting the contract price to 3.65 cents, New York.

**Zinc**—Gains in shipments and unfilled orders disclosed by April statistics together with the strong ore situation give the market a very firm undertone, although new business is rather light.



Two interior views of a new service station of the Ohio Oil Co. in Findlay, Ohio, built of translucent molded glass blocks, a product of the Owens-Illinois Glass Co.



## Exporters Endorse Bargaining Policy

**Favor Governmental Credit Guarantee for Encouraging Nation's Foreign Business**

NEW YORK—The agreement on foreign trade policy of more than 600 of the principal firms in the United States engaged in foreign trade is announced by the National Foreign Trade Council with the publication of the full text of the Final Declaration of the Pittsburgh National Foreign Trade Convention. The declaration is the most elaborate issued by foreign traders within recent years and its statements, particularly on the tariff, are designed to strengthen the hands of the present administration, according to the Council, in the negotiations with other nations for commercial agreements that shall have sound reciprocal advantages.

Significance also attaches to the unanimous resolution of the Convention, as expressed in the declaration, in favor of governmental export credit guarantees, provided that this extended credit is approved by the foreign trade community and that effective use shall be made of it.

The declaration also recommends a vigorous prosecution of all proper means to repatriate American funds frozen abroad by exchange restrictions, urges the early creation of the American Council of Foreign Bondholders to safeguard the interest of American bondholders and to promote the continuance of trade with the countries concerned, recommends that modification of inter-governmental debts be compensated by treatment guaranteeing the fair access of American goods to foreign markets, and strongly urges the retention of the Bureau of Foreign and Domestic Commerce as an effective agency of American trade promotion.

For the first time that a large and representative trade body has had occasion to decide upon the "Buy American" propaganda, the declaration comes out flatly against "Buy National" campaigns in all countries, including our own, and concludes with a vigorous declaration opposed to the issuance of fiat money in any form, stating that "It is only by a sound money system that there can be an early return to prosperity."

### Gabriel Quarterly Statement

CLEVELAND—Gabriel Co. reports for the quarter ended March 31, net loss after charges of \$28,865, against \$43,465 last year.

### Reo Cuts Loss

LANSING, MICH.—Reo Motor Car Co. cut its losses almost in half for the first quarter of this year as compared with the same period in 1932.

Reo's loss for the first quarter of 1933 was announced this week at \$459,245 as compared with \$733,277 a year ago. Truck sales are increasing and the new self-shifter is causing officials to look for a considerable pick-up in passenger car sales.

### N. Y. Makes Safety Glass Mandatory

ALBANY, N. Y.—Shatterproof glass will be mandatory in the windows and windshields of all automobiles registered in this state after January 1, 1935 under a bill signed by the Governor on May 6. After January 1, 1934, all buses will be required to have safety glass.

### Chevrolet Ahead of 1932

DETROIT—Production of Chevrolet cars and trucks in April numbered 59,953, an increase of 55,433 over April, 1932. For the first four months of this year Chevrolet was 11 per cent ahead of last year, the respective totals being 208,000 and 188,000.

### DeLuxe Beacon Models

A line of deluxe body models on the Standard Beacon chassis are announced by Continental. Prices are two-passenger coupe, \$425; two-door sedan, \$440, and four-door sedan, \$460.

### A. C. & F. M. Annual Report

NEW YORK—American Car & Foundry Motors Co. reports net loss of \$1,723,264 for 1932, against a loss of \$1,936,500 in 1931. The balance sheet shows a working capital deficit of \$2,968,130 as of Dec. 31, 1932.

### Spicer Quarterly Report

TOLEDO—A net loss after charges of \$146,954 is reported by Spicer Mfg. Co. for the first quarter of 1933, against a first quarter loss of \$171,880 in 1932.

## AC April Sales Run 108% Ahead of March

**All Departments on Full Time with More Employees Than in April Last Year**

FLINT, MICH.—Big gains in employment, in production and sales for April have been reported by AC Spark Plug Company. During the month all departments worked full time, consisting of from 45 to 54 hours a week, an increase of nearly 100 per cent over April a year ago. Some 200 employees were added last month, making a total of more than 2500, a numerical increase over April, 1932.

April sales over March sales increased 108 per cent in dollar volume, and 40 per cent over April, 1932, with a corresponding increase in production. Factory payroll for April this year showed an increase of 63 per cent over April last year. Unfilled orders on hand for spark plugs to be used in the replacement field were materially higher on May 1 than at any time in the past two years.

Commenting upon the increased activity, Harlow H. Curtice, president, said: "Operations are continuing at a high level and indications are that they will be slightly increased during May and continue at these increased levels during June."

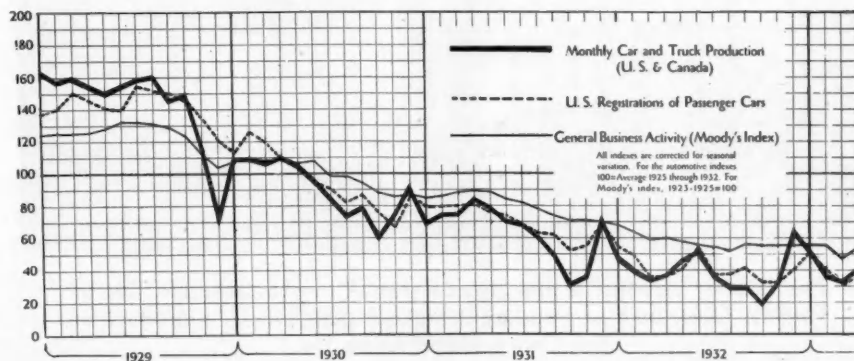
### B. O. P. Closes Retail Stores

DETROIT—D. U. Bathrick, former eastern sales manager for Oakland and recently head of the Mid-West region for Buick-Olds-Pontiac Sales Co., has been appointed head of the home office zone, to succeed James B. Dickson, Jr.

Charles Brady, in charge of retail stores for Buick-Olds-Pontiac, has been transferred to Cleveland as manager of the B.O.P. office in that city. The retail stores formerly under Mr. Brady have been abolished.

George Stableford, assistant to the regional manager of Buick-Olds-Pontiac in Detroit, has been named head of the business management division for the home office.

## Production, Sales and Business Turn Up





## N.S.P.A. to Mail Chicago Show Blanks on May 15

### Members Not to Be Favored in Exhibit Space Drawings

DETROIT—A show prospectus and space application blanks for the International Automotive Trade Show, to be held in the Stevens Hotel, Chicago, Oct. 30-Nov. 3, under the auspices of the National Standard Parts Association, will be mailed to manufacturers about May 15, according to an N.S.P.A. bulletin.

The bulletin states that—"Applications for space will be accepted from manufacturers of the National Standard Parts Association; also from those manufacturer members of the Motor & Equipment Manufacturers Association, whose products and methods of wholesaler distribution are normally comparable with those of the N.S.P.A."

"There will be no discrimination as to method of space allotment between members of the two associations—all will be on the same basis and subject to the same rules and regulations."

"There will be available 346 exhibit spaces, average size 10 x 10. The uniform rate to all exhibitors will be 75c. per square foot, which includes booth erection, sign, rug, and standard booth furniture as heretofore."

## Willys Claim Filing Period Extended

TOLEDO—Delay in the formulation of plans for reorganization of the Willys-Overland Co. was seen here today in the granting of an order by Federal Judge George P. Hahn, for a 45-day extension of the time for filing of claims by creditors. This brings the deadline to July 9. Originally 60 days expired May 24.

The Court has also approved the plan of the receivers to distribute \$90,000 additional in the form of a 30 per cent payment to workers for back wages on Saturday. This will bring the total paid to 70 per cent. County officials waived tax liens in favor of the wage claimants.

The plant is finishing rapidly its stock of Willys 77's and they appear to be selling well, considering receivership handicap.

## Willys 1933 Models at Reduced Prices in N.Y.

A. W. Pickett, district sales manager for Willys-Overland, in commenting on the reduced price sale being held locally of new 1933 Willys cars said: "Decision was reached Tuesday to sell these new Willys cars below factory cost as part of the plans looking toward reorganization, in order to convert this item into cash as quickly as possible so that plans can go forward without interruption."

## Correction

In the tabulations on pages 550, 551 of the May 6, 1933 issue of Automotive Industries 000 was omitted on all amounts except percentages.

## Phila. Section Gets Membership Awards

PHILADELPHIA—Philadelphians who got their man in the great SAE membership drive received the official awards at the last regular Philadelphia Section meeting, May 10. John A. C. Warner, who presented the awards, and Dr. H. C. Dickinson, the speaker of the evening, were guests of the Section; Norman G. Shidle presided. John F. Hardecker, placing first not only in his section but nationally, was awarded full life membership in the Society, also a midget radio. L. M. Porter, tied for second place with R. N. Du Bois of Detroit section, received second place award, three years paid-up dues. A. Gelpke and O. M. Thornton, recipients of special honorable mention in national ranking, were given SAE pins. The Philadelphia Section was awarded a section banner for placing first.

## Wage Increases Announced

PHILADELPHIA—Pay increases have been announced during the week by the Cord Corp., Norwalk Tire and Goodyear, among others. The Cord raise amounts to five per cent and effects all affiliated companies, including, of course, Auburn, Duesenberg and Lycoming. The Norwalk increase also is five per cent. At Goodyear, a 12½ per cent reduction made earlier this year and applying to salaried workers, was restored. Moreover, the Goodyear office force was put on five days of eight hours, instead of the seven-hour day effective recently.

## Motor Wheel Shipments Biggest in Three Years

LANSING, MICH.—Shipments of the Motor Wheel Corporation for April were largest of any month since April, 1930, S. Clarence C. Carlton, secretary, announced. He also said first eight days of May exceeded first 10 days of April. Over 200 men have been called to work in last four weeks and hours of others have been increased to average 40 a week.

Statement of Motor Wheel issued Tuesday shows net loss of \$207,267 for first quarter, which compares with a loss of \$228,609 for the same period of 1932. Officials point out that most of the loss was during banking holiday when most automotive plants closed.

## Battery Makers Adopt Trade Practice Rules

### Modify Warranty on Basis of Ampere-Hour Capacity

LOUISVILLE, KY.—A lot of work and profitable activity was packed into the day and a half during which the Spring Meeting of the National Battery Manufacturers Association was held. The meeting started with a joint conference under the auspices of the Industrial Cooperative Committee, of which L. B. F. Raycroft of the Electric Storage Battery Co. is chairman. Attending this meeting were members of the association and others engaged in the battery manufacturing business. Out of this meeting grew an adoption by the committee of the Trade Practice Conference Rules and an amended form of warranty.

In this warranty some relatively slight changes were made in the basis for determining the guarantee on different types or sizes of batteries. Under the new system which is regarded as more equitable and scientific, the warranties are calculated on ampere-hour capacity with the 20-hour rate as a basis. Provision is made for a 90-day guarantee of material and workmanship with the repair or replacement of unsatisfactory or faulty units at the seller's option. Beyond the 90-day period adjustments will be made at the owner's cost on a basis either of months of service or thousands of miles per month of use. A table has been compiled giving the number of months warranty on each type and size of battery based on ampere-hour capacity.

At the business and technical sessions addresses were made and papers read by President E. D. Martin of Emark Battery Co.; O. W. A. Oetting, chairman of the technical committee, of the Globe Union Mfg. Co.; H. D. Stanley, Emark Battery Corp.; R. O. Watkins, Universal Battery Co.; H. B. Taylor, Eagle Pitcher Lead Co.; S. W. Rolfe, Willard Storage Battery Co.; H. D. Wilson, Prest-O-Lite; B. H. Schubert, National Lead Co.; and others who joined in the discussion.

S. E. Baldwin of the Willard Storage Battery Co., led a discussion on merchandising, advertising and distribution.

Committee reports were made by the following chairmen: C. L. Feldtkeller, Consignment Committee; A. R. Reid, Data Book Committee; H. A. Harvey, Dealer Cooperation; E. H. Green, Jr., Publicity Committee; Geo. H. Souther, Patents, Compensation and Legislation; C. H. Munson, Traffic; A. F. Strayer, Uniform Cost Accounting; H. D. Stanley, Rebuilt Batteries; R. D. Mowry, Ways and Means; H. B. Taylor, Membership; E. H. Boges, Statistical Committee; E. T. Foote, Guarantee Committee.

It was decided to hold the Fall meeting in Chicago in November, during the last weeks of the "Century of Progress" exposition.

## April Good Month for Studebaker Sales

SOUTH BEND, IND.—April orders for Studebaker and Rockne passenger and commercial cars as of record April 29 totaled 5376 units, Paul G. Hoffman, president of The Studebaker Sales Corp. of America, announced today.

This figure represents an increase of 88.7 per cent over orders as of record March 31, despite the fact that there were two less business days in April than in March.

"We are going into May with more than 1500 unfilled orders on hand and additional orders for May shipment are arriving daily in gratifying numbers, Mr. Hoffman said. Our South Bend plants are now giving employment to between 5000 and 6000 people on a part time or spread work basis.

"A substantial number of new dealer contracts were received during April bringing the total to 1850 Studebaker contract and 1766 Rockne contracts. These are exclusive of dealer contracts covering Studebaker trucks."

## Detroit-New York by Air at Rail Rates

DETROIT — American Airway, Inc., have opened a direct passenger service between Detroit and New York on a three hour, forty-seven minute schedule and have reopened for the summer their amphibian connection between Detroit and Cleveland.

New low fares compare with railroad plus Pullman, as follows:

	American Airways	R.R. plus Pullman
Detroit to New York...	\$34.70	\$33.60
Detroit to Chicago....	13.25	13.56
Detroit to Cleveland...	10.75	9.56
Round Trip.....	19.35	19.12

## Adams Succeeds Eustis

NEW YORK—Richard J. Adams, for several years editor of the ASA Bulletin, has been appointed general manager and executive secretary of the Automotive Service Association of New York, succeeding John E. Eustis, who has been the association's executive officer for about 10 years.

## New Cars Make Canadian Debut

TORONTO—The past week has seen the introduction of two new models in Canada. Hudson-Essex of Canada, Limited, has brought out a Special Six Terraplane with a wheelbase increased to 113 inches. Prices range from \$695 for the roadster to \$845 for the convertible model, these prices being quoted at factory, Tilbury, Ontario. Taxes and license extra.

May 13, 1933

## New York Stopping Distance Standards

NEW YORK—New standards for stopping distances of vehicles with foot and hand brakes have been adopted by the Police Commissioner on recommendation of the Committee on Brakes, appointed by the Commissioner to investigate the functioning of brakes under current manufacturing methods and under normal New York City highway conditions.

The members of the Committee were David Beecroft, of the Bendix Corporation; Dr. F. C. Stanley, of Raybestos, Inc. and S. G. Tilden, of S. G. Tilden, Inc., Harold Riegelman, Attorney; Thomas W. Rochester, Chief Engineer of the Police Department, and Lt. George S. Andrews, of the Vehicle Homicide Squad.

The new stop requirements are as follows:

Speed Miles per Hour	Feet per Second	Stopping Distances in Feet		
		2- Wheel Brakes	4- Wheel Brakes	Emer- gency Brakes
5...	7.3	2.7	1.4	3.1
6...	8.8	3.9	2.0	4.5
7...	10.3	5.3	2.7	6.1
8...	11.7	6.9	3.6	8.0
9...	13.2	8.8	4.5	10.1
10...	14.7	10.8	5.6	12.5
11...	16.1	13.1	6.7	15.1
12...	17.6	15.6	8.0	18.0
13...	19.1	18.3	9.4	21.1
14...	20.5	21.2	10.9	24.5
15...	22.0	24.4	12.5	28.1
18...	26.4	35.1	18.0	40.5
20...	29.3	43.3	22.2	50.0
25...	36.7	67.7	34.7	78.1
30...	44.0	97.4	50.0	112.5
35...	51.3	132.6	68.0	153.1
40...	58.7	173.2	88.8	200.0
45...	66.0	219.2	112.4	253.1
50...	73.3	270.6	138.8	312.5
55...	80.7	327.5	167.9	378.1
60...	88.0	389.7	199.8	450.0

NOTE: A—Vehicles should meet above requirements when loaded.  
B—Two-wheel brakes stopping distances have been adjusted to allow for 17 per cent transfer of weight.

Dominion Motors, Limited, Toronto, has announced the "shiftless gear" Reo, this being similar to the gear-changing system on the Armstrong-Siddeley car which has been retained for several years. There is no gear lever, a button on the dashboard taking its place. The button is pushed to engage the gear in starting, after which gear changing is automatically governed by the speed of the car.

## Burnett Named Sales Head

CHICAGO—Fred. C. Burnett has been appointed director of sales of Ryerson & Haynes, Inc.

Mr. Burnett, in assuming his new connection, which became effective April 1, has resigned as general sales manager of the Federal Pressed Steel Co., Milwaukee.

## Graham April Shipments 16 Per Cent Ahead of '32

DETROIT—For the first time in eight months, Graham shipments exceeded the record for the same month of the previous year with a total of 963 cars in April, a gain of 16 per cent over April, 1932. An even sharper gain of 45 per cent marks the April total as compared with the preceding month. Demand held up throughout the month, resulting in heavy shipments during the final week, and, on April 28, in a new record for the year in the number of cars shipped on any one day. On evidence that the sales curve will continue upward, the factory has ordered its May production schedule stepped up 33 per cent higher than the figure originally set. Overseas shipments in April shared in the gain, with 96 cars exported, a 70 per cent jump over April, 1932.

## Adcraft Club Elects

DETROIT—The following officers of the Adcraft Club of Detroit were elected recently:

George M. Slocum, Detroit manager of MacFadden Publications, president; Walter Boynton, Campbell-Ewald Co., vice-president; Leo Fitzpatrick, vice-president and general manager WJR, vice-president; Gordon K. MacEdward, president Animated Advertising Displays, Inc., treasurer; Edwin W. Husen, president E. W. Husen Co., secretary. Harold M. Hastings continued as secretary-manager.

The directors are: John B. Gaughen, Detroit Manager, Capper Publications, past president; J. J. Hartigan, vice-president Campbell-Ewald Co.; C. W. Hungerford, advertising manager, Michigan Bell Telephone Co.; Herbert Ponting, general manager, Detroit News; Verne Tucker, Campbell-Ewald Co.; Thomas G. Wade, Detroit manager, Curtis Publishing Co.

Installation of new officers will take place at a luncheon Friday, at the Hotel Statler, at which Gilbert D. Craine, Jr., publisher of *Advertising Age*, will be the speaker.

## Hund Resigns

DETROIT—Henry E. Hund, general manager of Briggs Manufacturing Company for the past several years, has resigned. No reason for the resignation was given and to date no successor has been named.

## B. & S. Reports Profit

MILWAUKEE—Briggs & Stratton Corp. reports net profit after charges of \$1,324 for the first three months of 1933 as compared with \$8,959 in the same period last year.



## Plymouth Near Record in April

DETROIT — April production of Plymouths totaled 24,534, an increase of 11 per cent over scheduled output. This was the second largest month in Plymouth history. May output is likely to exceed 26,000 units which will top all production records since August, 1931. More than 6000 men are now employed at the main plant here.

## Continental Building 2-Cycle Navy Diesels

DETROIT — Continental Motors Corp. is building two 2-cycle, 6-cylinder Diesel engines for the Navy Department, according to an announcement made by president W. R. Angell.

The two Continental engines which will develop 200 horsepower at 2000 r.p.m., are to be installed in two torpedo retriever boats for use by the Naval Torpedo Station at Newport, R. I. Cylinders are 4½ in. x 5½ in. bore and stroke. A feature of the design is the use of sleeve valves to control the exhaust and scavenging ports, also the use of gear driven, Roots type scavenging blowers.

## LaFrance-Republic Reports

DETROIT — LaFrance-Republic Corp. reports net loss of \$370,204 for 1932, as compared with a net loss of \$215,074 in 1931.

## Buick Sales 4786

DETROIT—Buick sales in April totaled 4786 cars. During the month Buick dealer inventories of used cars increased from 13,802 to 13,933.

## Wayne County Sales Top April, 1932

DETROIT—New passenger car registrations in Wayne county during April totaled 3165 against 2557 in the same month last year and 1657 in March this year. Ford with 1182, represented approximately 37 per cent of the total sales for the month. Chevrolet registered 699 compared with 466 for the previous month and 820 in April a year ago. Plymouth was third on the list with 282, Dodge fourth with 241 and Pontiac fifth with 224. The following makes showed increases over a year ago: Auburn, Dodge, Ford, Pontiac and Rockne.

Registrations of commercial cars totalled 137 against 99 in March and 217 in April, 1932. Ford was first with 62, Chevrolet second with 31 and Dodge third with 21.

# Automotive Oddities—By Pete Keenan

Write us if you know an Oddity



**GASOLINE TAXOLINE**

OFFICIALS OF STANDARD OIL SUGGESTED THIS CHANGE IN NAME AS A PROTEST AGAINST TAXES.





## G. M. April Retail Gains 51% on March

Four Months' Sales 11,101 Ahead of 1932—U. S. Sales Only 6% Behind Last Year

NEW YORK—Retail sales of General Motors cars and trucks to U. S. consumers totaled 71,599 in April, a gain of 51 per cent over March and a decline of 12 per cent from April, 1932. In the first four months of 1933, domestic sales numbered 211,968 as compared with 225,087 in the same period last year, the percentage decrease approximating 6.

April sales to U. S. dealers amounted to 74,242, indicating an increase in dealer inventories during the month of 2643. A year ago sales to dealers were 69,029 while in March of this year they were 45,098, the respective gains being 7 and 64 per cent. For the first four months, sales to U. S. dealers totaled 241,826 against 235,333 in the same months of last year, an increase of 3 per cent. Comparison with retail deliveries indicates an increase in field inventories of about 30,000 units since the first of the year.

Total sales to dealers in the United States and Canada plus overseas shipments were 86,967 in April, against 58,018 in March and 78,359 a year ago, representing gains of 50 and 11 per cent respectively. For the four-month period, total sales to dealers amounted to 286,716, an increase of 4 per cent over the same months in 1932.

### Amsco Alloys

CHICAGO HEIGHTS, ILL.—It is announced by the American Manganese Steel Co. that the trade-name, "Fahrallloy" for heat-resisting alloys will be used exclusively by F. A. Fahrenwald, effective July, 1933. Mr. Fahrenwald terminated his contract with the company on Feb. 15.

Hereafter, the nickel-chromium alloy castings made by this company are to be identified by the trade name, "Amsco Alloys."

### Walton Heads D.E.S.

DETROIT—H. L. Walton, a member of the firm of Smith, Hinchman & Grylls, will head the Detroit Engineering Society for the coming year, succeeding Dr. F. O. Clements, technical director of the General Motors Research Laboratory, who is the retiring president.

Other elections are: H. S. Ellington, member of the firm of Harley & Ellington, first vice-president; J. H. Hunt, Patent Section, General Motors Corp., second vice-president; A. B. Morrill, recently filtration engineer of the Water Board, secretary-treasurer; W. D. Cameron, district manager,

General Electric; J. F. Long, construction engineer, Michigan Bell Telephone; J. E. Mills, general manager, Dept. of Street Railways, and A. I. Snyder, chief engineer, Detroit City Gas Co., directors.

Charles F. Kettering, president of General Motors Research Corp., Dr. F. O. Clements and Mr. Walton spoke at the meeting Wednesday evening.

Appointments include: E. L. Brandt, managing secretary; A. S. Douglass, L. E. Williams, J. P. Hallihan and E. M. Walker, who are all past presidents, are also members of the board of directors.

### Anglemyer Joins Handy

DETROIT—Appointment of Herman B. Anglemyer as special engineer is announced by President A. A. Bull of the Handy Governor Corp. Mr. Anglemyer will devote major attention to the development of a complete line of new Handy Perfection Air Cleaners for heavy-duty service.

### Nehls with Detroit Metal

DETROIT, April 25—C. H. Nehls, formerly connected with Houdaille Hershey, has joined Detroit Metal Specialties Corp. as chief engineer.

## CALENDAR OF COMING EVENTS

### SHOWS

Motor & Equipment Manufacturers Assoc., Chicago .....Oct. 23-28  
Natl. Standard Parts Assoc., Chicago .....Oct. 30-Nov. 3

### CONVENTIONS

National Association of Cost Accountants Convention, Waldorf-Astoria Hotel, New York .....June 12-15  
National Industrial Advertisers Assoc., Chicago .....June 26-28

### MEETINGS

Natl. Automobile Chamber of Commerce, Annual, New York City, June 8  
Natl. Retail Hardware Assoc., Indianapolis .....June 12-16  
A.S.M.E. Natl. Aeronautic Meeting, Chicago .....June 26-27  
American Society for Testing Materials, Chicago .....June 26-30  
Automotive Engine Rebuilders Assoc., Annual, Chicago .....July 10-14  
International Automotive Engineering Congress of the S.A.E., Chicago, Aug. 28-Sept. 4  
American Chemical Society, Chicago, Sept. 11-15  
American Transit Assoc., Chicago, Sept. 18-20  
Natl. Safety Council, Chicago, Oct. 2-6  
National Metal Congress, Detroit, Oct. 2-6  
American Petroleum Institute, Annual, Chicago .....Oct. 24-26

### SECTION MEETINGS—S. A. E.

Baltimore .....May 18  
Canadian .....May 17  
Cleveland .....May 18  
Metropolitan .....May 18  
Southern California .....May 19  
Washington .....May 17

### RACES

Indianapolis Race .....May 30

## Geschelin Discusses Equipment Policies

Presents Paper on Selection and Replacement of Machinery Before Industrial Engineers

PHILADELPHIA—Economic factors entering into the selection and replacement of manufacturing equipment were discussed in detail in a paper read at the May meeting, the Society of Industrial Engineers, Philadelphia Chapter, by Joseph Geschelin, engineering editor, *Automotive Industries*. Mr. Geschelin took as his theme, "that a sound and comprehensive equipment policy is essential—for those who intend to stay in business; for those who expect to maintain leadership in a competitive market; for those who want to produce at a profit."

It was pointed out that perhaps the biggest problem in industry is to develop active cooperation between the factory and the major executives, particularly those who control the purse strings. The recent history of many large organizations shows that factory executives have been hamstrung in their efforts to modernize, simply because of the enervating effect of an archaic accounting set-up.

The paper dealt with many aspects of the problem, such as, depreciation, obsolescence, burden rates, etc. The field of universal, flexible, and single-purpose equipment was examined in detail. Attention was given to the latest development in the design of machine tools, utilization of new cutting tool materials, etc. Several newly modernized plants such as Plymouth, Lycoming, and Cummins were described.

In conclusion the following points were stressed: 1. That management needs a sound equipment policy if it is to continue to produce a profit for its stockholders and workers. 2. That a liquid sinking fund, earmarked for the purpose, is needed to assure the purchase of needed improvements. 3. That the book value of existing equipment must be written down in line with replacement values and prices in the second-hand market. 4. That the equipment policy must be designed cooperatively by the factory and comptrollers' departments, and must reflect a uniform handling of depreciation rates, book values, burden rates, etc.

### Clark and McFarlane Named

TORONTO—Two Canadians have been appointed to high posts in General Motors of Canada, Limited, according to announcement by H. A. Brown, vice-president and general manager. Wallace H. Clark has been promoted to executive manager of the assembly and sheet-metal plants of the Canadian organization, while R. J. McFarlane is appointed general purchasing agent.